Revising TRI Burden to Ratio-Based Methodology

Information Collection Request Renewal (ICR) 2nd FR Notice

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Abstract

The TRI Program Division is proposing to revise the TRI burden methodology to a Ratio-Based Burden Methodology (RBBM) to boost efficiency and sharpen transparency. Through simplifications, internal consistency, and better access, EPA staff and the general public will obtain faster, more reliable, and more understandable burden estimates for a variety of uses. The TRI Program Division envisions implementing this methodology in the 2012 ICR Renewal. Thereafter, the methodology will also be employed in economic analyses associated with TRI rulemakings.

RBBM simplifies calculations and imposes internal consistency while maintaining the overall total Program burden estimate as a starting point. The revised structure consists of four ratio models plus one base number, the *Nominal Form R unit burden*. The ratio models characterize key relationships of TRI burden estimation. For example, the *A/R* model, a ratio of Form A (single-chemical) to Form R burden, ensures internal consistency between Form A and Form R burden estimates. The *Nominal Form R unit burden* provides a comprehensive unit burden of 35.7 hours per Form R and consequently also supports focused discussions about burden estimate accuracy.

TRI's burden estimates comply with Paperwork Reduction Act (PRA) requirements for providing burden estimates, "to the extent practicable," while reflecting a reasonable sense of average conditions and an appropriate level of specificity. The activities included in burden estimates are the same in RBBM as under the previous methodology. For activities associated with filing TRI Form R/Form A chemical reports, burden estimates include: rule familiarization, compliance determination, calculations and Form completion, and recordkeeping and submission. For activities unrelated to Form reporting, burden estimates include: supplier notification, non-reporter compliance determination, and petitions.

As a result of RBBM's simplicity, internal consistency, and accessibility, the TRI Program Division anticipates that staff will need to spend less time and effort developing TRI information collection burden information. In addition, ease of re-creating estimates supports administrative consistency, while improved access to calculations affords greater transparency.

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Revising TRI Burden to Ratio-Based Methodology

Introduction

The purpose of this document is to provide technical explanation and documentation for the Ratio-Based Burden Methodology (RBBM), as currently proposed for use in the Toxics Release Inventory (TRI) Program. In addition, EPA explains how RBBM will be able to provide improvements in efficiency, administrative consistency, and transparency. EPA begins with an overview of the methodology, followed by background information, and research comparing burden estimate methodologies. EPA then explains the RBBM approach, including quantitative details of its constituent methods, such as the Steady State Total Burden Calculation (page 10). Lastly, EPA presents the benefits of using RBBM. Appendices A-E supplement the main body of the report. More specifically, EPA provides an overview of the methodology in Appendix A, followed by technical appendices for each of the constituent methods: Steady State Total Burden Calculation, Form Element Estimation, First-Time Filer Estimation, and Cost Conversion (Appendices B-E, respectively).

Additional appendices F-H are provided as reference material. Appendix F depicts the Program Staff Tool, a Microsoft Excel spreadsheet which is designed to provide a user-friendly interface for generating burden estimates. Appendix G provides the Abt Associates Engineering Studies, which provide previously developed detailed data element-specific burden estimates used as the building blocks for RBBM's ratio models. Appendix H summarizes the May 2010 peer review of an earlier draft of this document. Also useful for reference are: 1) the Form R and Form A ICR Supporting Statements[1] from the 2008 TRI ICR, and 2) the Form R and Form A ICR Supporting Statement[2] for the ICR slated in 2012, which illustrate the existing and revised methodologies, respectively. The latter item is being published concurrently with this document (originally and with this revised version).

Overview

Ratio-Based Burden Methodology (RBBM) simplifies calculations, establishes internal consistency, and sharpens transparency while retaining the components of the existing methodology and maintaining the overall total Program burden estimate as a starting point. EPA initiated this methodology revision due to its experience with Information Collection Request (ICR) renewals and rulemaking economic analyses (EAs) that were particularly complex and/or performed under tight time constraints. In less formal settings, additional ideas for characterizing burden emerged from staff experiences while generating burden estimates. Consequently, EPA sought improvements on the current approach, as guided by two key questions: 1) What is the simplest and easiest way to calculate burden? and 2) How can EPA best provide clearly defined and consistent estimates?

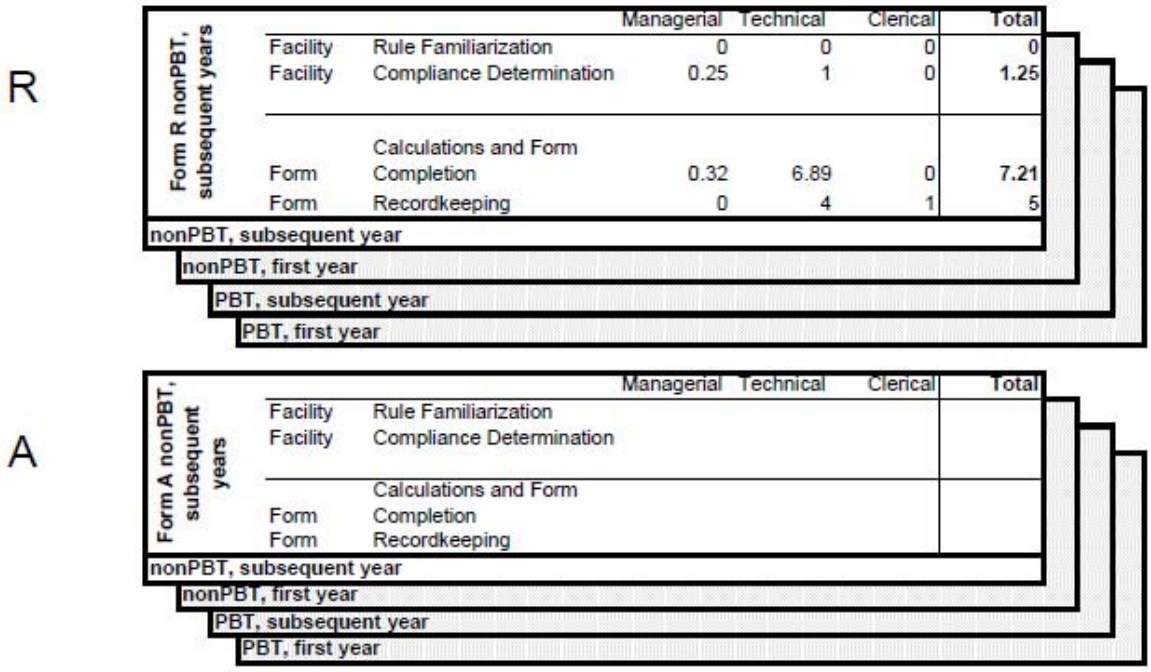
The current methodology for estimating burden hours and cost is based on a system of 96 factors organized into four categories as shown in Figure 1. There are 96 total factors because for each of the four categories—persistent bioaccumulative and toxic (PBT) first year, PBT subsequent

[1] *Toxics Release Inventory (TRI) Form R Toxic Chemical Release Reporting Information Collection Request Supporting Statement.* EPA ICR #1363.15. March 02, 2008. and *Toxics Release Inventory (TRI) Alternate Threshold For Low Annual Reportable Amounts; TRI Form A Toxic Chemical Release Reporting Information Collection Request Supporting Statement.* EPA ICR # 1704.09. March 2, 2008. Docket #EPA-HQ-TRI-2007-0355.

[2] *Toxics Release Inventory (TRI) Form R and Form A Toxic Chemical Release Reporting Information Collection Request Supporting Statement.* EPA ICR#1363.21. OMB Control No. 2025-0009. Date Forthcoming. Docket # EPA-HQ-OEI-2010-0835; hereafter referred to as TRI 2012 ICR Supporting Statement.

year, nonPBT first year, nonPBT subsequent year—there are 12 factors (two for each facility-level and form-level, estimated across three labor categories—managerial, technical and clerical). Taking those 12 factors across four categories and two Forms (R and A) yields this total of 96 factors. For each category's set of factors, such as Form R non-PBT subsequent year unit burdens, a relevant subpopulation TRI chemical count must be provided – for example, the number of subsequent year non-PBT Form R chemicals. The factors in Figure 1 are referred to as OMB-approved, as these unit burdens are officially approved by the Office of Management and Budget (OMB) for use in estimating TRI Program burden as of March 27, 2008.

Figure 1
Current Methodology Complexity: Numerous Burden Factors and Chemical Counts



In developing RBBM, EPA decided to restructure this system for several reasons: 1) calculations could be greatly simplified via algebraic reduction, 2) relationships between interrelated categories could be specified via ratio models to remove potential internal inconsistencies, 3) multiple scales could be unified to prevent certain accounting errors caused by double-counting (i.e., facility-level converted to form-level factors).[3]

Table 1 provides a structural comparison between the existing methodology and RBBM as applied to Form R burden.[4] Note that RBBM consolidates PBT factors and first-year factors within the base "Form R unit burden" to yield one unit burden instead of multiple unit burdens. Moreover, this single unit burden is comprehensive and thus incorporates all activities (e.g. rule familiarization, form completion, etc.) which contribute to the burden of Form R reporting.

[3]Under the existing methodology, the double-counting potential exists due to the facility-level unit burdens in two situations 1) via the structure by which Form A and Form R reporting is estimated separately with both estimates counting facility burden 2) the rulemaking context in which additional reports are added from facilities that already handle facility level burden regardless of the changes imposed by the rule. Both these sources of error are prevented in RBBM.

[4] The same comparison applies for Form A, but is omitted for ease of presentation.

Therefore, in addition to requiring fewer unit burdens (with fewer subpopulations to track), RBBM's comprehensive unit burden permits the estimation of total burden by simply multiplying just one unit burden by the total number of chemicals. In this case, total "Form R burden" can be estimated by "Form R unit burden" multiplied by the "number of Form R chemicals."

Table 1: Burden Methodology Calculation Factors and Unit Burdens – Form R

Current Burden via Existing Methodology	**Steady State Burden via RBBM**
Estimate Description: Sum the numerous products of factors multiplied by chemical counts or facilities (depending on the scale of the factor).	Estimate Description: multiply the comprehensive unit burden by total number of chemicals.
<u>Estimation Factors</u> Per (chemical) form-level: • hrs per PBT, subsequent year, • hrs per PBT, first year • hrs per non-PBT, subsequent year • hrs per non-PBT, first year per facility-level: • hrs for PBT and non-PBT, subsequent year • hrs for PBT and non-PBT, first year	<u>Estimation Factor</u> Per (chemical) form-level: • hrs per chemical*
<u>Reported Unit Burdens</u> (do not include related facility-level burden) ➔ 29.66 hrs per Form R non-PBT (subsequent year) ➔ 53.34 hrs per Form R PBT (subsequent year)	<u>Reported Unit Burden</u> ➔ 35.7 hrs per Form R

* Incorporates all the same considerations as the existing methodology. Simplifications are detailed in the Ratio-Based Burden Methodology, Methods and Models Section (p.9). See also Appendix B.

Focusing on RBBM information in Table 1 to present the total burden estimate, Figure 2 provides the Steady State Total Burden Calculation, RBBM's primary method. *Steady State Total Burden* is the estimate of the ongoing TRI Program burden, as updated by rulemakings' permanent impacts, but absent any first-time filer impacts. Note that the only inputs required for this estimate are the total counts of Form R and Form A chemicals. Next, EPA describes the key factors within RBBM's reformulated structure.

The *Nominal Form R unit burden* is the unit burden for Form R. As a component of RBBM, it provides the base number for the entire methodology. For the transition to RBBM, its value is back-calculated in order to maintain the established baseline's total burden. In practice, the *Nominal Form R unit burden* provides the primary focal point for assessing and maintaining RBBM's accuracy.

Form A unit burden is defined as *Nominal Form R unit burden* multiplied by *A/R*, a model of the ratio of Form A single-chemical burden[5] to Form R burden. The value for *A/R* is derived by assessing the Form R burden for activities similarly required to complete a Form A. *A/R*

[5] Although Form A permits multiple chemical reports on the same form (on average 2.31 chemicals per Form A), for purposes of methods development and modeling, EPA works with chemical counts, referring to "Form R chemicals" and "Form A chemicals." Note that for Form R reporting, there is only one chemical per Form.

specifies the relationship between Form A and Form R burden.[6] The examples in Table 1 and Figure 2 illustrate that RBBM incorporates the same components of the existing methodology, but offers a much simpler formulation. Furthermore, the use of ratio models such as *A/R* ensures internal consistency within the new structure.

Figure 2
Ratio-Based Burden Methodology
Two Unit Burdens; Two Chemical Counts; One Wage Rate

Steady State Total Burden Calculation

1) *Steady State Total Burden = Form R Burden + Form A Burden + Non-Form Burden*

Where:
*Form R Burden = (# Form R Chemicals) * (Nominal Form R Unit Burden)*
*Form A Burden = (# Form A Chemicals) * (A/R) * (Nominal Form R Unit Burden)*
Non-Form Burden
= (Supplier Notification) + (Non-Reporter Compliance Determination) + (Petitions)

And:
A/R, Ratio of Form A Burden to Form R Burden = 0.615
Nominal Form R Unit Burden = 35.7 hours per Form R Chemical
Form A Unit Burden (derived) = 22.0 hours per Form A Chemical

2) *Steady State Total Cost = Steady State Total Burden * (WAWR)*

And:
WAWR, Weighted Average Wage Rate = $49.62/hour[†]
[†] Based on June 2010 wage data. Wage data: http://www.bls.gov/ncs/ect/#tables

TRI Burden Estimate Requirements and Uses

Under the Emergency Planning and Community Right to Know Act (EPCRA), the TRI Program, as authorized under Section 313, requires reporting facilities to submit data annually on use and management of toxic chemicals. As part of EPA's responsibilities to the public under the Paperwork Reduction Act (PRA), EPA must regularly satisfy requirements that permit information collection from members of the general public, including industry participants in the TRI reporting community. One of these requirements is to ensure that each information collection exercise "…informs the person receiving the collection of information of—…(III) an estimate, to the extent practicable, of the burden of the collection."[7] Burden estimates encompass "…the total time, effort, or financial resources expended by persons to generate, maintain, retain, disclose, or provide information to or for a federal agency." These estimates should consider time needed to: [8]

[6] The bases for *A/R* include detailed burden estimates by task, making the *A/R* model verifiable and readily subject to validation. See Appendix B for development and Appendix G for detailed burden estimates by task.
[7] US National Archives and Records Administration, Paperwork Reduction Act of 1995, Accessed 23 Mar 2010 < http://www.archives.gov/federal-register/laws/paperwork-reduction/3506.html >
[8] See EPA. 1999. ICR Handbook: EPA's Guide to Writing Information Collection Requests Under the Paperwork Reduction Act of 1995. Accessed 2 Feb 2010 < http://www.epa.gov/wed/pages/opportunities/icrhndbk.pdf>

- Review instructions;
- Develop, acquire, install, utilize technology and systems, for the purpose of collecting, validating and verifying information, processing and maintaining information, and disclosing and providing information;
- Adjust the existing ways to comply with any previously applicable instructions and requirements;
- Train personnel to be able to respond to a collection of information;
- Search data sources;
- Complete and review the collection of information; and
- Transmit or otherwise disclose the information.

For the TRI Program, these considerations translate to factors that reflect industry efforts associated with form burden—rule familiarization, compliance determination, calculations and form completion, recordkeeping, and non-form burden—supplier notification, non-reporter compliance determination, and petitions.

The TRI Program uses burden estimates in the context of three main types of Program activities: ICR renewal, rulemaking economic analyses, and informal informational gathering. At the time of the ICR renewal, which is performed every three years, EPA's TRI Program must update the burden estimates that OMB has on record for the current burden associated with TRI reporting. The Supporting Statement for the ICR renewal provides estimates of the program's ongoing burden—or steady state total burden—in labor hours, and cost in current dollars. These estimates are obtained based on actual conditions as measured in the most recent TRI reports.[9]

In the context of a rulemaking, the economic analysis provides burden estimates in order to predict the impact of the policy change(s) under consideration. Upon policy implementation, this estimated incremental change in burden is added or subtracted from the current burden estimate that OMB has on record. If the rulemaking increases the number of reporters or otherwise imposes reporter start-up burden, the economic analysis also provides estimates of first-time filer burden incurred during the first year of a policy change. Note that economic analysis estimates, both steady state and first-time filer, are based on models—not actual conditions. If there are differences between the economic analysis predictions and the actual conditions, these differences are implicitly reconciled at the next ICR renewal as the ICR is based on actual reporting of Form R and Form A chemicals.[10]

Background Research: Relevant History and Methodology Comparisons

The information in this section provides background in preparation for presenting more detail about RBBM in the next section. The methodology history explains how the TRI Program

[9] Estimates based on actual conditions contrast to estimates based on model projections. Note that in the event that the TRI program implements policy changes due to a rulemaking finalized in the course of the year of the ICR renewal project, the ICR renewal burden estimates are updated using more current information and/or models.

[10] For example, when new policy permits decreases in reporting that are not fully utilized, the economic analysis may predict a reduction in reporting, while the ICR measures the actual reporting at levels higher than originally modeled/anticipated.

burden methodology has evolved. Methodology comparisons show that EPA's existing and revised methodologies fit within the range of currently accepted practices.[11]

Methodology History

Under the existing methodology, EPA calculates total industry burden estimates using a methodology established at the TRI Program inception that has since been periodically reviewed and approved by OMB during ICR renewals. For example, as the program underwent changes in reporting—such as implementing the shorter Form A—the methodology underwent reviews and occasional revisions. Beyond minor adjustments to include additional form elements, the biggest revision occurred in the 2004 ICR Renewal when changes to the system of unit burden factors were adopted.

As preparation prior to the 2004 ICR renewal, EPA staff questioned the magnitude of estimates and related unit burdens which had not been updated since the beginning of the TRI program, given the fact that the program had implemented technological advances designed to ease reporter burden.[12] Based on numerous evidentiary sources, EPA proposed a systematic revision to the methodology. After the public comment period and OMB review, partial revisions were implemented which lowered total burden estimates by 49%,[13] and also resulted in: [14]

- Reducing the amount of Form R Non-PBT unit burden, while holding PBT unit burden constant, thereby unintentionally imposing a distinction in which PBT burden is 1.73 of non-PBT burden (i.e., 73% higher). This change occurred as an offshoot of the revision process, rather than as a deliberate specification.
- Maintaining the ratio of Form A unit burden to Form R unit burden at .64 as previously determined.[15]

Subsequently, during the Phase I Burden Reduction Rule, EPA proposed to revise the methodology using a basis developed in Abt Associates Engineering Studies. The July 2004 document and methodology was peer-reviewed with results posted in the public docket (Proposed Rule EPA HQ-TRI-2005-0073). The method was neither finalized nor formally adopted into TRI burden estimation practice.

By the time of the 2008 ICR revision, TRI staff and management recognized sources of potential internal inconsistency that, at a minimum, led to confusion and/or inefficiency. For example, the ratio of .64 for Form A to Form R burden was not readily verifiable. Additionally, the effective ratio of 1.73 for PBT to non-PBT burden was not directly specified, and therefore could not be verified. Lastly, procedures for revising/adding form elements occasionally used a set of estimates which were not reconciled to the whole (form) unit burden, and therefore could not be

[11] Per analysis in Table 2. Sources: EPA -TRI Program Staff (June 2009); IRS – Office of Research, Taxpayer Analysis and Modeling Group (June 2009).
[12] An electronic version of the Reporting Forms and Instructions was initially implemented in desk-top software (*TRI-ME* CD) and later upgraded to Web-based technology (*TRI-MEweb*).
[13] Total TRI Program burden estimate was decreased from 6.03 million to 2.61 million hours based on Notices of OMB Action (called Paperwork Reduction Submissions) for Form R ICR and Form A ICR. Submitted October 27, 2003; Approved January 9, 2004. Per the 2004 ICR Supporting Statement, 85.95 % of the (57%) total reduction was associated with adjustment of "unit burden for Form R completion in subsequent years from 47.1 to 14.5 hours," yielding a 49% decrease in total burden associated with the methodology change. See Appendix B for full breakdown of the 2004 ICR renewal 57% decrease.
[14] For context and details, see: Rice, Cody. 2004. Terms of Clearance for TRI ICR Renewal. Regulations.gov. Accessed 23 Dec 2010 <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OEI-2004-0006-0004>
[15] See Appendix B for additional detail and references to supporting material.

applied consistently across Form R and Form A. As a result of these issues, EPA staff had limited ability to manage questions about the origin and validity of burden estimates. From these observations, EPA concluded that a revised methodology should require internally consistent and verifiable unit burdens.

Methodology Comparisons

In the process of seeking guidance for RBBM's design, EPA staff reviewed a range of approaches to burden estimation in government information collections, all of which conform to PRA requirements. Table 2 depicts methodology features from several high volume collections, including TRI. In this discussion, the term "calibration" refers to a method by which estimates are compared to, and reconciled with, an actual measurement of the quantity that they are designed to estimate.[16] The IRS 1120 (U.S. Corporation Income Tax Return) and IRS 1040 (U.S. Individual Income Tax Return) collections employ a lower and higher level of accuracy in their methodologies, respectively, when compared to TRI. EPA's TRI burden methodologies (both the existing and the algebraically equivalent RBBM) fall in between, with high specificity but no calibration via representative sampling.[17] Across the columns of Table 2, the differences in approaches address different applications and correspondingly require different types of maintenance.

With the IRS examples, additional specificity accompanies higher precision because the more complex 1040 burden estimation employs calibration using a representative sample. In contrast, TRI burden estimates are derived from best professional judgment without this type of calibration. Generally, the TRI-type of methodology develops calculations drawing from an appropriate amount of specificity and some sense of average values. Overall, calibrated estimates are more accurate than uncalibrated estimates; but highly specified estimates are not necessarily more precise (and hence not necessarily more accurate) than less specified estimates. In the context of TRI's uncalibrated estimates, increasing specificity (i.e., adding variables) adds complexity without necessarily increasing precision. EPA concludes that neither TRI's existing nor revised methodologies require additional specificity. EPA also considered enhancing the TRI methodology with calibration via a representative survey but did not wish to impose additional burden on the TRI reporting community. TRI's approach is appropriate and complies with PRA requirements for providing burden estimates, "to the extent practicable" while reflecting a reasonable sense of average conditions and an appropriate level of specificity.[18]

In summary, the internal consistencies identified during the 2008 ICR Renewal, and the insight above regarding appropriate complexity lay the groundwork for RBBM's design. A simpler formulation is derived with ratio models ensuring internal consistency across Forms R and Forms A, as well as from form elements to whole forms.

[16] This definition contrasts with the one used in scientific circles that discuss measurement techniques, where accuracy has two components: non-bias and precision. In such contexts, calibration is assured using a high precision "standard." Outside this context (as in RBBM), estimates achieve accuracy by approximating the average conditions and incorporating an appropriate level of specificity.

[17] Note as a matter of context that the TRI Program's methodology is the Agency's most complex (per Rick Westlund, OEI Office of Information Collection 1/13/2010).

[18] RBBM allows for future enhancements. As the single base number, the *Nominal Form R* burden may be adjusted to reflect updates identified via calibration or other sources.

Table 2: Burden Estimation Methodology Features from Example Government Information Collections
Sources: EPA—TRI Program Staff (June 2009); IRS— Office of Research (June 2009)

	IRS 1120 Corporate (ADL) Uncalibrated/ Low Specificity	**TRI Current Form R and Form A** Uncalibrated/High Specificity	**TRI Proposed (RBBM) Form R and Form A** Uncalibrated/Simplified Specificity (Equivalent to TRI Current)	**IRS 1040** Individual (ITBM) Calibrated/ High Specificity
Description	Burden depends on: • the number of lines on the form instructions • the number of fields • the number of attachments • the number of line items completed	Burden depends on: • Unit burdens for Form A and Form R (PBT, non-PBT) set by informed decisions based on best professional judgment and input via Public Comment • Estimates of Incremental increases to form burden based on Abt Associates Engineering estimates and case-by-case evaluations	Burden depends on: • Internally consistent and verifiable unit burdens for Form A and Form R. Unit burdens reflect the number of elements and related calculations. Nominal Form R unit burden set by informed decisions based on best professional judgment and input via Public Comment. • Estimates of incremental increases to form burden utilize internal consistent system of standardized form element estimates	Microsimulation Model: • Burden is modeled as a function of taxpayer characteristics • The model is applied to a representative sample of tax returns and the resulting burden estimates extrapolated to the population as a whole
Methods Development	Model burden based on readily observable variables	Identify element-level processes; assign values for associated activities	Restructure to simplify and to ensure internal consistency. Retain previously identified processes; utilize Abt Associates Engineering estimates of element-level burden on a relative basis (in ratio models).	Identify element-level processes; calibrate via representative survey
			• Model relationships between population subsets as ratios	• Survey individuals' completion time of complete low level processes
			• Maintain same baseline burden as a starting point.	• Model burden based on taxpayer characteristics
				• Generalize model results to population
Assumptions	Few, strong assumptions	Several, unverifiable assumptions	Few, measurable assumptions	Many, validated assumptions
Updates/Survey Requirements	Based on survey data for one population extended to other populations	Not based on survey data	Not based on survey data (capability exists for future upgrade)	Model calibrated with 2008 survey data, update planned for 2011.
	Updates as there are changes to forms	Updates as there are changes to forms; otherwise, wholesale adjustments are non-sytematic	Updates as there are changes to forms; otherwise wholesale adjustments streamlined and internally consistent	Model inputs updated yearly
Strengths	Easy to update	Satisfies PRA requirements	• Easy to update	• Accuracy (calibration)
			• Increased understanding	• Increased understanding
			• Robust	• Robust
			• Simple and transparent	• Explicitly considers preparation method (self or tax-preparer)

Ratio-Based Burden Methodology, Methods, and Models

The revised methodology simplifies a set of multiple, large matrices to four ratio models plus one base number for Form R unit burden. This simplification converts the system to a new structure, as depicted in the equation below.

Burden Hours = fct [(Nominal Form R Unit Burden), (A/R), (PBT/non-PBT), (FTF_f)]

and

*Cost = (Burden Hours)*WAWR*

Where:

fct	Means "a function of"
Nominal Form R Unit Burden=	Single base number for the entire methodology; provides the focal point for assessing and maintaining estimate accuracy
A/R =	Ratio of burden for single-chemical Form A to Form R
PBT/non-PBT =	Ratio of burden for PBT chemical to non-PBT chemical
FTF_f = *(First-Time Filer Factor)*	Ratio of burden for first-time (first year) filers to steady state (subsequent year) filers
WAWR = (Weighted Average Wage Rate)	Cost conversion factor in current $ per hour; incorporates fixed proportions of Managerial, Technical, and Clerical labor categories.

Specifications Within a New Structure

The summary equation above applies to the entire system of methods and relevant models. In this methodology's final formulation, and as described below, RBBM accomplishes the following design objectives:

- Internal consistency maintained via ratio models
  - Steady state burden—*A/R*, *PBT/non-PBT*
  - First-time filer burden factor—FTF_f
  - Standardized Form Element Burdens, as comprehensive estimates that are consistent from element to Form, as well as across Form R and Form A
- Algebraic and substantive simplifications, including: 1) neglect the effects of first-time filers in steady state burden estimates[19] 2) set the PBT/non-PBT model equal to one[20]
- Unified scales across activity-specific unit burdens – i.e., facility-level factors were re-scaled to (per chemical) form-level factors for both Form A and Form R
- One-step conversion from hours to current dollars, using *WAWR*
- Overall total Program burden estimate maintained as a starting point

[19] The incremental contribution for first-time filing burden produces a very slight increase to the *Steady State Total Burden* estimate, as reflected in the calculated effect of modeling error on the *Steady State Total Burden estimate at -.04%*. See Appendix B.

[20] Specified as a ratio model, but set to the default value for the ratio equal to one, due to the lack of verifiable alternative. See Appendix B for qualitative evidence considered (public comments and engineering studies).

Table 3 presents the decision rules used to direct simplifications and ensure internal consistency. See Appendices A-E for further detail. Regarding the ratio models, EPA used estimates for form subtasks from the Abt Associates Engineering Studies as building blocks, particularly for *A/R* and FTF_f (See Appendix G for these studies). For example, the value for *A/R* is derived by assessing the Form R burden for activities similarly required to complete a Form A.

Table 3: Methodology Development Decision Rules

Rule	Description	Models
1	Derive Form A numbers from Form R numbers using estimates of burden by activity	*A/R*
2	Use Form R basis where additional complexity for Form A basis is unmerited	FTF_f, *WAWR*
3	Make simplifying assumptions where they are mathematically justified	*A/R* Model regarding First-Time Filers, *WAWR*
4	Make simplifying assumptions where a distinction is not backed up by quantitative and/or statistical evidence (especially when the need for evidence is expressed by stakeholders)	*A/R* Model regarding *PBT/non-PBT*
5	When scaling to Nominal Form R unit burden, scale up elements equally, in proportion to their contributions to the total	Standardized Form Element Burdens
6*	Back-calculate the Form R unit burden in order to maintain the established baseline's total burden	*Nominal Form R unit burden*

* Preserving the existing methodology's total burden estimate is important because TRI burden estimates are primarily used to track changes from year to year against an established baseline. EPA defines the methodology transition point as the time of the last ICR approval with conditions specified by 2008 ICR renewal projections. At that point in time, the Program burden totals calculated under existing and revised methodologies are identical. See Appendix B for detailed calculations of *Nominal Form R unit burden*.

The RBBM Models and Equations

Figure 4 depicts the entire system of equations for the RBBM. The values for key factors are:

- *Nominal Form R unit burden* is 35.7 hrs per Form R
- *A/R* is .615 hr/hr ; *PBT/non-PBT* is 1.0 hr/hr
- FTF_f is 2.1 hr/hr
- *WAWR* (June 2010) is $49.62/hr.

See also Appendix C for Standardized Form Element Burdens and related procedures for updates to the *Nominal Form R unit burden*, under RBBM.

Figure 4
RBBM System and Constituent Methods

Steady State Total Burden Calculation

Steady State Total Burden
= Form R Burden + Form A Burden + Non-Form Burden
= Nominal Form R Unit Burden# Form R Chemicals*
+ [Nominal Form R Unit Burden (A/R)*(# Form A Chemicals)] + Non-Form Burden*

Form Element Estimation

$$\textit{Nominal Form R unit burden}_{new} = \textit{Nominal Form R unit burden}_{old} + \textit{Form change burden}$$

First-Time Filer Estimation

$$\textit{First-Time Filer Burden} = FTF_f * (\textit{Relevant Steady State Burden})$$
$$= FTF_f *[(\textit{Nominal Form R Unit Burden} * \#\ \textit{New Form R Chemicals})] + [(A/R) * \textit{Nominal Form R Unit Burden} * \#\ \textit{New Form A Chemicals}]$$

Cost Conversion

$$\textit{Steady State Total Cost} = (\textit{Steady State Total Burden}) * WAWR$$

Ratio Models: Stability and Internal Consistency

Beyond imposing internal consistency and preventing related inconsistencies from developing in the future, ratio models are inherently more (roughly) stable and therefore more robust to changes than their component variables. For example, for *A/R* (the ratio of Form A burden to Form R burden) the value of the actual ratio (.615) remains stable over the course of typical Program changes. This ratio remains stable because the actual changes to Form R and Form A impose similarly small incremental burden changes to both the numerator and the denominator of the ratio, thus causing the ratio itself to remain roughly constant.[21] In contrast, the *Nominal Form R unit burden* requires routine updating because typical changes to the Form R increase or decrease actual reporting burden per Form R. Last, the ratio models are useful standalone metrics because they quantify key relationships between two elements. For example, *A/R* is .615, reflecting the burden of a Form A as 61.5% of the burden of a Form R, and implying that filing a Form A instead of a Form R yields a 38.5% burden reduction per chemical.

Nominal Form R Unit Burden: Comprehensive Focus and High Utility

The *Nominal Form R unit burden* provides a number of functions. As already stated, it is the base number for the entire methodology, providing a single focal point for discussions about methodology accuracy. This contrasts with the existing methodology in which numerous factors and variables are maintained and the suggestion to add more variables (e.g., staff turnover) arises frequently. Instead, RBBM supports focused discussions about whether 35.7 hours per Form R is the correct base number. Second, revisions are straightforward. In rulemaking and ICR revision, Form R changes are estimated and applied to the *Nominal Form R unit burden*. Other changes in the system are automatically propagated via the ratio models (to Form A and for first-time filers). Similarly, when EPA receives information indicating that overall burden estimates are either too high or too low, the *Nominal Form R unit burden* is the single primary point of adjustment.

As a clarification on RBBM's design, note that Decision Rules 4 (*PBT/non-PBT*=1) and 6 (back-calculated *Nominal Form R unit burden*) both impact the definition for nominal Form burden, as well as the resultant overall structure of RBBM. In choosing to leave the value of the *PBT/non-*

[21] Note that in the event that the Form R and/or Form A undergo extreme revisions that alter the relationship between *A/R* burden, then *A/R* would require updating.

PBT ratio at the default value of one, the back-calculated base number (*Nominal Form R unit burden*) remains a single focal point for considering overall average conditions for Form R burden per chemical.[22] This single focal point is afforded by the simplicity of the overall Steady State Total Burden Calculation that also does not required a *PBT/non-PBT* model and tracking of related separate subpopulations. Moreover, given that the back-calculated *Nominal Form R unit burden* preserves the existing totals as a starting point (Decision Rule 6), RBBM carries forward certain prior assumptions from the existing methodology without explicitly modeling them. In particular, note that the higher PBT reporting burden is incorporated into the *Nominal Form R unit burden's* starting value of 35.7 hours/Form R, which is elevated above the value that would have been otherwise obtained—at about 30 hours/form—had only non-PBT burden been used to determine *Nominal Form R unit burden*.[23]

In opting for simplicity over specificity via the RBBM approach (even if *PBT/non-PBT* burden were quantified), EPA retains the sophistication of a single unit burden for Form R reporting with Form A reporting burden closely linked. The *Nominal Form R unit burden* reflects overall "average" conditions, without the need to add variables. In short, any effect that EPA needs to consider is incorporated into the average conditions of the *Nominal Form R unit burden*.

In the event that the overall PBT/non-PBT relationship is determined, EPA could restructure to a more complex total burden calculation,[24] or keep the simpler formulation by updating the *Nominal Form R unit burden* (single base number) on a prorated basis. Regardless, EPA would then be able to estimate burden differences associated with PBT chemical reporting, as needed.

EPA supports this value of 35.7 hours per Form R as a reasonable approximation of the actual unit burden, based on years of review and scrutiny to which the current total burden estimate has been subjected. The unit burden of 35.7 hours, in the context of a new system of ratio models, is the culmination of prior accuracy assessments (see methodology history). Therefore, this basis is legitimized for ultimately setting the magnitude of the Program total burden at this time.

Benefits

With the simplified and internally consistent calculations plus a user-friendly interface via the Program Staff Tool (shown in Appendix F), EPA expects RBBM to streamline burden estimation. In addition to saving time, RBBM enhances administrative consistency with shorter, more straightforward procedures that are readily replicated and consistently communicated. Last, RBBM increases transparency because burden information is available in a more accessible, compact, and comprehensive format that is easier to use. As a result, EPA staff and the general public will obtain an increased understanding of the key drivers of burden estimation for a variety of purposes, including those encountered in the context of public policy changes. Therefore, EPA recommends the adoption of RBBM for the TRI Program, beginning with the 2012 ICR renewal.

[22] Moreover, RBBM's total burden calculation does not have the complexity of tracking separate subpopulations for Form R PBT and non-PBT chemical reports.
[23] For the transition, the previous methodology's inclusion of a higher PBT unit burden for 20% of chemical reports is rolled up into the new back-calculated unit burden. Similar logic applies to first-time filer effects, though the impact is negligible.
[24] Requires the inclusion of the *PBT/non-PBT* ratio and separate chemical counts for Form R PBT and non-PBT subpopulations.

Appendix A

Methodology Overview and Guide to Methods Technical Appendices (B – E)

This appendix presents an overview of the revised methodology, Ratio-Based Burden Methodology (RBBM) as a guide to the other more detailed Appendices B-E. As such, this appendix does not provide back-up evidence or justify assumptions; that information is covered in the relevant detailed appendices:

- Appendix B – Steady State Total Burden Calculation
- Appendix C – Form Element Estimation
- Appendix D – First-Time Filer Estimation
- Appendix E – Cost Conversion

The methodology revision project that culminated as RBBM started in May 2009, with technical document writing initiated in March 2010. The draft technical document was submitted for peer review on May 1, 2010. The peer reviewers endorsed the methodology as credible and effective (See Appendix H for summary). As a result, EPA left all of RBBM's design and major procedures in tact. EPA then revised the technical document, addressing specific questions/critiques of the methodology and implementing editorial suggestions from peer reviewers and other sources. Throughout the project, EPA employed interdisciplinary teams for methodology development, document development, and document revisions.

RBBM development was guided by the methodology priorities of simplicity, internal consistency, and transitional baseline continuity and was more precisely specified by broadly applicable decision rules. These rules are presented on page 10 in the main report and discussed herein. The methodology revision entails restructuring a set of large matrices to a system of four ratio models plus one base number (*Nominal Form R unit burden*, derivation to follow). Additionally, Standardized Form Element Burdens replace case-by-case engineering estimates for use in updating unit burden to reflect Form changes, such as burden associated with adding a new element.

There are two major classes of burden estimates in TRI applications: steady state burden and first-time filer burden. *Steady State Total Burden* is the estimate of the ongoing TRI Program burden, as updated by rulemakings' permanent impacts, but absent any first-time filer impacts. These are the burden estimates that OMB has on record that are re-estimated in full at ICR renewal time. Similarly, when an economic analysis (EA) is conducted in association with a rulemaking, the ongoing incremental change in burden is added or subtracted from the *Steady State Total Burden*, constituting a sustained steady state change in burden. In a related application, the Form Element Estimate provides revisions to unit burden due to changes in Form R/Form A filing requirements which can occur either in the ICR renewal or in a rulemaking.

In contrast to steady state, first-time filer burden (previously termed first-year year burden) accounts for the elevated level of effort that reporters incur during a start-up year. In RBBM, first-time filer burden is estimated using a ratio model that reflects the increased burden over and above relevant steady state burden. Given this structure, EPA first derives models supporting the *Steady State Total Burden* estimate, including the restructuring and related Form Element Estimation. Thereafter, First-Time Filer Estimation is presented. Last, Cost Conversion is presented, as this method is applicable to all burden estimates.

Appendix A

Steady State Burden

The Steady State Total Burden Calculation consists of Form burden and non-Form burden. In the next sections, EPA derives the portions of the restructured system pertaining to Form burden. This first set of derivations demonstrates that the proposed approach is a greatly simplified algebraic equivalent to the existing method. The next section provides the derivation for the *A/R* model that is central to the new structure. After that, EPA presents a revised and slightly modified calculation for non-Form burden that addresses TRI burden not directly captured by filling out a Form R or A. EPA then provides the procedure for back-calculating the base number, *Nominal Form R unit burden*. Finally, EPA presents an overview of the related Form Element Estimation.

Restructuring the System

The existing method for estimating Form burden consists of an extensive system of matrices that can be collapsed and further simplified. The matrix notation for Form R burden hours is:

Eqn. A-1: Form R Burden hours = $[F]_{\text{chem. category, activity, YR, labor category}} * [N]_{\text{forms}}$

Eqn. A-2: Form R Cost = $[F]_{\text{chem. category, activity, YR, labor category}} * [N]_{\text{forms}} * [\$]_{\text{labor category}}$

Where:

chem category =	PBT or Non-PBT
activity =	Rule familiarization, compliance determination, form completion, recordkeeping and submission
YR=	First year or subsequent year
labor category =	Management, technical, or clerical labor

And where:

$[F]_{\text{chem category, activity, YR, labor category}}$	18x3 matrix of reporting activity factors with subsets depending on whether the Form is for a PBT or non-PBT chemical, and a first year or subsequent year filing…with three columns for the three labor categories (managerial, technical, clerical)
$[N]_{\text{forms}}$	1x18 vector of TRI chemical counts according to the categories specified in matrix F
$[\$]_{\text{labor category}}$	3x1 vector of current dollar wage rate ($/hr) for managerial, technical, and clerical labor

Note that a parallel set of matrices exist for Form A burden estimation in the existing methodology. However, as the new methodology derives Form A-related burden exclusively from Form R, the derivation that follows need only pertain to Form R.

The detailed list of OMB-approved unit burdens as of March 27, 2008 for reporting activities (hereafter known as factors) for Form R non-PBT and PBT chemicals are presented in Tables A-

1 and A-2, respectively. An alternative set of factors for non-PBT only, as developed in the Abt Associates Engineering Studies (for source reference, see Appendix G) and derived by EPA, are presented in Table A-3 for Form R and Form A. Table A-4 provides the slightly reformulated version of Table A-3's factors, incorporating RBBM conversion of facility-level unit burdens to (per chemical) form-level. The totals in Table A-4 apply directly to building RBBM ratio models (used later in Eqns. A-4, A-9, and A-10). For the purposes of deriving the system simplification, however, Tables A-1 and A-2 may be combined to populate the comprehensive matrices below. Note that these tables' factors are a mixture of facility-level and form-level constants.

Table A-1: OMB-Approved Burden, Non-PBT

				Managerial	Technical	Clerical	Total
Form R (non-PBT)	first year	Facility	Rule Familiarization	12	22.5	0	**34.5**
			Compliance Determination	4	12	0	**16**
		Form R	Calculations and Form Completion	20.5	44.4	2.8	**67.66**
			Recordkeeping	0	4	1	**5**
				Managerial	Technical	Clerical	Total
	subsequent	Facility	Rule Familiarization	0	0	0	**0**
			Compliance Determination	1	3	0	**4**
		Form R	Calculations and Form Completion	7.55	16.08	1.03	**24.66**
			Recordkeeping	0	4	1	**5**

Table A-2: OMB-Approved Burden, PBT

				Managerial	Technical	Clerical	Total
Form R (PBT)	first year	Facility	Rule Familiarization	12	22.5	0	**34.5**
			Compliance Determination	4	12	0	**16**
		Form R	Calculations and Form Completion	20.28	43.87	2.70	**66.86**
			Recordkeeping	0	4	1	**5**
				Managerial	Technical	Clerical	Total
	subsequent	Facility	Rule Familiarization	0	0	0	**0**
			Compliance Determination	1	3	0	**4**
		Form R	Calculations and Form Completion	14.10	30.37	1.86	**46.34**
			Recordkeeping	0	4	1	**5**

Appendix A

Table A-3: Abt Associates Engineering Study Factors, Non-PBT with Derived Form A

				Managerial	Technical	Clerical	Total	Derived Form A Total*
Form R (non-PBT)	first year	Facility	Rule Familiarization	1	22.5	0	**23.5**	**23.5**
			Compliance Determination	1	13.7	0	**14.7**	**14.7**
		Form R	Calculations and Form Completion	0.37	10.49	0	**10.86**	**3.39**
			Recordkeeping	0	4	1	**5**	**5**
				Managerial	**Technical**	**Clerical**	**Total**	**Derived Form A Total***
	subsequent	Facility	Rule Familiarization	0	0	0	**0**	**0**
			Compliance Determination	0.25	1	0	**1.25**	**1.25**
		Form R	Calculations and Form Completion	0.32	6.89	0.0	**7.20**	**2.30**
			Recordkeeping	0	4	1	**5**	**5**

* Form A burden estimates are derived from Form R by summing the burden associated with Form R data elements for which a reporter would make calculations to determine their Form R eligibility as well as the data elements they actually report on Form A.

Table A-4: Ratio-Based Burden Methodology "Building Blocks" for Ratio Models

				Abt Associates Factors, Mixed Scales		Ratio-Based Burden Methodology Unit Burdens, Consistent per Chemical Scale		
				Form R	**Derived Form A***	**Ratio Model Bases**	**Form R**	**Derived Form A***
Form R (non-PBT)	first year	Facility	Rule Familiarization	23.5	23.5	R, A Chemical **	6.07	6.90
			Compliance Determination	14.7	14.7		3.80	4.31
		Form R	Calculations and Form Completion	10.86	4.27	R, A Chemical	10.86	4.27
			Recordkeeping	5	5		5	5
			Form Burden Per Chemical Total	**N/A**	**N/A**		**25.73**	**20.48**
	subsequent	Facility	Rule Familiarization	0	0	R, A Chemical **	0	0
			Compliance Determination	1.25	1.25		0.32	0.37
		Form R	Calculations and Form Completion	7.2	2.34	R, A Chemical	7.2	2.34
			Recordkeeping	**5**	**5**		**5**	**5**
			Form Burden Per Chemical Total	**N/A**	**N/A**		**12.52**	**7.71**

*Form A burden estimates are derived from Form R by summing the burden associated with Form R data elements for which a reporter would make calculations to determine their Form R eligibility as well as the data elements they actually report on Form A.
** Facility-level factors converted to form (per chemical) level factors via equivalent chemicals per facility for R (3.87) and A (3.41). See Appendix B Supplement for derivations In practice Form R reports contain one chemical per report and Form A allows multiple chemicals (2.3 on average).

Starting with the F * N matrix product (represented by Eqn. A-1), with F being an array of factors (burden per form or facility), and N a vector of variables (form or facility counts), EPA simplifies by collapsing the entire set of factors to one constant and reducing vector N to one variable—total Form R chemical counts. However, in order to make this simplification, EPA must convert the factors to the same unit of analysis (per chemical form-level) by dividing facility-level factors by the applicable average number of Form R chemicals per facility, $Rcpf_e$.[1] Expanding the matrix notation and standardizing the factors' units, F * N becomes F′ * N.

Matrix System F′ * N

$\frac{F_{NPBT,fYR,RF,m}}{Rcpf_e}$	$\frac{F_{NPBT,fYR,RF,t}}{Rcpf_e}$	$\frac{F_{NPBT,fYR,RF,c}}{Rcpf_e}$		$N_{NPBT,fYR}$
$\frac{F_{NPBT,fYR,CD,m}}{Rcpf_e}$	$\frac{F_{NPBT,fYR,CD,t}}{Rcpf_e}$	$\frac{F_{NPBT,fYR,CD,c}}{Rcpf_e}$		$N_{NPBT,\ fYR}$
$F_{NPBT,fYR,CFC,m}$	$F_{NPBT,fYR,CFC,t}$	$F_{NPBT,fYR,CFC,c}$		$N_{NPBT,fYR}$
$F_{NPBT,fYR,REC,m}$	$F_{NPBT,fYR,REC,t}$	$F_{NPBT,fYR,REC,c}$		$N_{NPBT,fYR}$
$\frac{F_{NPBT,sYR,RF,m}}{Rcpf_e}$	$\frac{F_{NPBT,sYR,RF,t}}{Rcpf_e}$	$\frac{F_{NPBT,sYR,RF,c}}{Rcpf_e}$		$N_{NPBT,sYR}$
$\frac{F_{NPBT,sYR,CD,m}}{Rcpf_e}$	$\frac{F_{NPBT,sYR,CD,t}}{Rcpf_e}$	$\frac{F_{NPBT,sYR,CD,c}}{Rcpf_e}$		$N_{NPBT,\ sYR}$
$F_{NPBT,sYR,CFC,m}$	$F_{NPBT,sYR,CFC,t}$	$F_{NPBT,sYR,CFC,c}$		$N_{NPBT,sYR}$
$F_{NPBT,sYR,REC,m}$	$F_{NPBT,sYR,REC,t}$	$F_{NPBT,sYR,REC,c}$		$N_{NPBT,sYR}$
$\frac{F_{PBT,fYR,RF,m}}{Rcpf_e}$	$\frac{F_{PBT,fYR,RF,t}}{Rcpf_e}$	$\frac{F_{PBT,fYR,RF,c}}{Rcpf_e}$	*	$N_{NPBT,fYR}$
$\frac{F_{PBT,fYR,CD,m}}{Rcpf_e}$	$\frac{F_{PBT,fYR,CD,t}}{Rcpf_e}$	$\frac{F_{PBT,fYR,CD,c}}{Rcpf_e}$		$N_{PBT,\ fYR}$
$F_{PBT,fYR,CFC,m}$	$F_{PBT,fYR,CFC,t}$	$F_{PBT,fYR,CFC,c}$		$N_{PBT,fYR}$
$F_{PBT,fYR,REC,m}$	$F_{PBT,fYR,REC,t}$	$F_{PBT,fYR,REC,c}$		$N_{PBT,fYR}$
$\frac{F_{PBT,sYR,RF,m}}{Rcpf_e}$	$\frac{F_{PBT,sYR,RF,t}}{Rcpf_e}$	$\frac{F_{PBT,sYR,RF,c}}{Rcpf_e}$		$N_{PBT,sYR}$
$\frac{F_{PBT,sYR,CD,m}}{Rcpf_e}$	$\frac{F_{PBT,sYR,CD,t}}{Rcpf_e}$	$\frac{F_{PBT,sYR,CD,c}}{Rcpf_e}$		$N_{PBT,\ sYR}$
$F_{PBT,sYR,CFC,m}$	$F_{PBT,sYR,CFC,t}$	$F_{PBT,sYR,CFC,c}$		$N_{PBT,sYR}$
$F_{PBT,sYR,REC,m}$	$F_{PBT,sYR,REC,t}$	$F_{PBT,sYR,REC,c}$		$N_{PBT,sYR}$

Figure A-1: Sample Definition of Matrix Term

$F_{PBT,fYR,RF,m}$

Where:

PBT = Chemical category is PBT form. (Other possibility is non-PBT)
fYR= Year is first year of filing. (Other possibility is subsequent year of filing)
RF = Activity is rule familiarization. (Other possibilities are compliance determination, calculations and form completion, and recordkeeping and submission)
m= Labor category is managerial. (Other possibilities are technical and clerical)

[1] Although this appears to be a straightforward conversion, in practice it was not. EPA derived "equivalent chemical per facility," for Form R and Form A, based on distributions of Form R and Form A chemicals within and across facilities, on average. See Appendix B Supplement for details.

Appendix A

To help clarify terms, Figure A-1 defines the terms for an example variable in the matrix. The value of each variable is contained in Tables A-1, A-2 (existing methodology), and A-3, A-4 (revised methodology).

Assuming that the first-time filer effect is negligible and asserting the model that *PBT/non-PBT* burden=1 (i.e., on average no quantifiable difference between burden for filing a PBT chemical report versus a non-PBT), the matrix factors reduce to a simple sum. Correspondingly, the matrix product reduces to the unit burden (hours per Form R chemical) times the total number of Form R chemicals.

F″ * N′ (with matrix N reduced to the constant N_R for total number of Forms)

Matrix System F″ * N′

$\frac{F_{NPBT,sYR,RF,m}}{fpR_e}$	$\frac{F_{NPBT,sYR,RF,t}}{Rcpf_e}$	$\frac{F_{NPBT,sYR,RF,c}}{Rcpf_e}$		N_R
$\frac{F_{NPBT,sYR,CD,m}}{fpR_e}$	$\frac{F_{NPBT,sYR,CD,t}}{Rcpf_e}$	$\frac{F_{NPBT,sYR,CD,c}}{Rcpf_{e\ e}}$	*	N_R
$F_{NPBT,sYR,CFC,m}$	$F_{NPBT,sYR,CFC,t}$	$F_{NPBT,sYR,CFC,c}$		N_R
$F_{NPBT,sYR,REC,m}$	$F_{NPBT,sYR,REC,t}$	$F_{NPBT,sYR,REC,c}$		N_R

Eqn. A-3: [2] Form R Burden Hours $= N_R\left(\sum_{i=1}^{4}\sum_{j=1}^{4} F''_{i,j}\right) = N_R C_R$

Where:

C_R= Sum of all factors in the matrix, reflecting the unit burden per Form R chemical

Intuitively, one would state this equation as follows: "the total Form R burden hours estimate is the product of the Form R unit burden times the number of chemicals filed by Form R where the unit burden consists of four contributing activities: rule familiarization, compliance determination, calculations and form completion, and recordkeeping and submission."

Ensuring Internal Consistency Using Ratio Models and Engineering Estimates

If EPA were to make simplifications such as "Form R burden hours = $N_R C_R$" and go no further, EPA would greatly reduce the computational and reporting complexity for TRI program burden calculations. However, this alone would not address one of the key concerns that led it to develop a new method: internal consistency. Consistency across Forms R and A is desired, as well as consistency in computing estimates of the first-time filing burden that affect new entrants to the reporting community as a result of policy change. Ratio models of *A/R* and first year burden/subsequent year burden (newly termed "first-time filer factor (FTF_f)") characterize the relationships between these estimates, regardless of the magnitude of the values used in the composite Form unit burdens. As seen by comparing Table A-1 and A-3, the OMB-approved numbers are higher than the Abt Associates Engineering Studies numbers.[3] These differences in absolute magnitude are not relevant to RBBM development of ratio models for the purpose of

[2] This equation uses standard matrix notation where *i* refers to the row of the matrix and *j* refers to the column.
[3] Differences are due to differences in origin: EPA OMB-approved estimates were defined at program inception (with periodic revisions), while Abt Associates' Engineering Study estimates were generated more than a decade after program inception.

providing internal consistency. Specifically, the Abt Associates Engineering estimates are used on a relative basis only, for building ratio models. Moreover, EPA concludes that the Abt Associates Engineering estimates are appropriate for RBBM's ratio models because they most reliably quantify the relative burdens of various tasks making them useful for quantifying relationships between key variables. As an added benefit, EPA's use of the Abt Associates Engineering estimates provides a means by which *A/R* and other models may be verified.[4] At another level, the Abt Associates Engineering estimates inform updates to the Nominal Form R unit burden which are internally consistent with the Form unit burden, based on Standardized Form Element Burdens (see more information later in this appendix and also in Appendix C).

Several models were specified using the Abt Associates Engineering Studies Form R non-PBT estimates presented in Table A-4. For clarification purposes, Table A-5 presents unit burden components as a percent of total Form R unit burden. This format provides information about activity-based components of unit burden on a percentage basis, regardless of the value of *Form R Nominal unit burden*.

Table A-5: Ratio-Based Burden Methodology Components, Standardized to Form R Basis

				Ratio-Based Burden Methodology Unit Burdens' Consistent per Chemical Scale *100%=Form R Unit Burden*		
				Ratio Model Bases	**Form R %**	**Derived Form A* %**
Nominal Form R(non-PBT)	**Subsequent year (Steady State)**	Facility Burden Apportioned to Form R	**Activity**			
			Rule Familiarization	R, A Chemical	0	0
			Compliance Determination		2.58	2.93
		Form R	Calculations and Form Completion	R, A Chemical	57.49	18.64
			Recordkeeping		39.93	39.93
			Form Burden Per Chemical Total Percentage of Form R Unit Burden		**100.00**	**61.50**

*Form A burden estimates are derived from Form R by summing the burden associated with Form R data elements for which a reporter would make calculations to determine their Form R eligibility as well as the data elements they actually report on Form A.

In the *A/R* ratio model, EPA ensures that Form A unit burden is related to Form R unit burden via the subset of tasks and data elements from Form R that are similarly required to complete Form A. Using the values in Table A-4, and the relevant elements of Matrix System F″ * N′, the *A/R* ratio model is computed at .615 as follows:

[4] See also discussions in Appendix B regarding benefits of ratio models and strengths/weaknesses of Abt Associates Engineering Studies.

Eqn. A-4: A/R = (Sum of Form A Factors (as derived from Form R) / Sum of Form R Factors)

$$= \frac{((F_{NPBT,sYR,RF,T} + F_{NPBT,sYR,CD,T})/Acpf_e) + F_{NPBT,sYR,CFC*,T} + F_{NPBT,sYR,REC,T}}{((F_{NPBT,sYR,RF,T} + F_{NPBT,sYR,CD,T})/Rcpf_e) + F_{NPBT,sYR,CFC,T} + F_{NPBT,sYR,REC,T}}$$

Notes

1 Facility level factors are converted to Form level factors using $Acpf_e$ and $Rcpf_e$

2 T subscript refers to managerial plus technical plus clerical labor

3 *$Acpf_e$* refers to *Equivalent Form A Chemicals per Facility* (see Appendix B Supplement)

4 *$Rcpf_e$* refers to Equivalent Form R Chemicals per Facility (see Appendix B Supplement)

5 CFC* refers to the Form A factor, as derived from Form R factor components; these burdens include Form A eligibility determination with half of Form R's Section 5 and 6 work plus all the tasks associated with Form R elements that also occupy Form A

The *A/R* value of .615 has the following interpretation: "the burden of a Form A as 61.5% of the burden of a Form R, implying that filing a Form A instead of a Form R yields a 38.5% burden reduction per chemical."

Transitioning to the New System

The final system of models calculates total burden as follows:

Eqn. A-5: *Steady State Total Burden = Form R burden + Form A burden + Non-Form burden*

Where:

- *Form R Burden = (# Form R Chemicals) * (Nominal Form R Unit Burden)*
- *Form A Burden = (# Form A Chemicals) * (A/R) * (Nominal Form R Unit Burden)*
- *Non-Form Burden*
  = (Supplier Notification) + (Non-Reporter Compliance Determination) + Petitions

And:

A/R=	Ratio model of single-chemical Form A unit burden to Form R unit burden[5]
Nominal Form R unit burden=	Single base number for the entire methodology; provides the focal point for assessing and maintaining estimate accuracy

To establish the starting point for RBBM that would provide a seamless transition to the new methodology, EPA estimated the nominal Form unit burden that would not produce a change in the *Steady State Total Burden* estimate. The back calculation yields a *Nominal Form R unit burden* of 35.7 hours/Form R:[6]

[5] For purposes modeling, EPA refers to "Form R chemicals" and "Form A chemicals" in order to provide a consistent metric across form types. In practice Form R reports contain one chemical per report and Form A allows multiple chemicals (2.3 on average).

[6] EPA defines the methodology revision's transition point as the time of the last ICR approval with conditions specified by 2008 ICR renewal projections. In the actual calculation EPA corrects for previous double-counting of facility level burden among facilities filing both As and Rs in the last ICR renewal, shifting the baseline downward slightly by 5460 hours (removes .13% overstatement). Non-Form Burden amounts are: Supplier Notification—

Eqn. A-6: *Nominal Form R Unit Burden =*
(Total Burden – Non-Form burden)/[# Form R Chemicals + ((A/R) # Form A Chemicals)]*

Form Element Estimation

Form Element Estimation provides a standardized and reproducible method for estimating updates to unit burden associated with form changes, replacing the case-by-case engineering approach used in the existing method. The model consists of Standardized Form Element Burdens, organized by "type" of element. The generalized format for using this method is:

Egn. A-7: $Nominal\ Form\ R\ unit\ burden_{new} = Nominal\ Form\ R\ unit\ burden_{old} + Form\ change\ burden$

Where:

Form change burden= estimate based on conditions of the form change, utilizing Standardized Form Element Burdens

Form element estimation is applicable any time changes to the reporting Form R, and by association, corresponding elements of the Form A, are involved. Changes to the reporting form can occur at ICR renewal and during rulemakings. Such changes impact the *Nominal Form R unit burden*. This method differs from the rest of RBBM's burden estimation methods because its specifications are tied to the magnitude of the *Nominal Form R unit burden*.

Figure A-2 at the end of this Appendix depicts the Standardized Form Element Burdens, as mapped onto an RY 2009 Form R. See Appendix C for further details including a list of Standardized Form Element Burdens by type of element, as well as related procedures for updating the *Nominal Form R unit burden.*

First-Time Filer Estimation

First-time filer burden, referred to as first year burden in the existing methodology, historically has two applications. First-time filer burden is estimated as part of the total Program burden estimate in ICR renewals to account for the portion of the reporting community with new entrants. The estimate of first-time filers is made by determining the number of facilities newly reporting to TRI in the year the ICR is updated. The number of new TRI reporters serves as an approximation for the number of new filers expected in any reporting year during the period covered by the ICR renewal. In the revised RBBM formulation, the impact of additional first-time reporter burden is neglected in the (newly termed) Steady State Total Burden Calculation.

In rulemakings, first-time filer burden is estimated to account for the start-up effect of a policy or regulatory change to the TRI reporting requirements—for example, when a new sector is added to the reporting community. In this example, during the year that to policy change is first implemented, the new reporters incur start-up burden which then reduces to steady state burden

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89,616 hours; Non-Reporters Compliance Determination—734,976 hours; and Petitions—925 hours (see Appendix B for further explanation)

in the next year. In the case of EAs, the first-time filer burden includes both the burden to facilities reporting to TRI for the first-time as well as the burden to existing filers in the first year of a policy or regulatory change. Under RBBM, EAs still typically report both steady state and first-time filer incremental burdens/costs associated with the new policy or regulation. For these estimates, only Form burden is relevant.[7] Given the overarching estimation method (Eqn. A-11), the first-time filer factor (FTF_f) is derived below.

Eqn. A-8 *First-Time Filer Burden = FTF_f * Relevant Steady State Total Burden*

Similar to the *A/R* model, the *FTF* model provides a consistent basis to estimate the first year burden relative to steady state burden for both Form R and Form A. It is developed using the ratio of Form R factors for the first year to Form R factors for subsequent years. Using the values in Table A-4 and the relevant factors from Matrix System F′ * N, the *first-time filer factor*, FTF_f, for RBBM is computed at 2.1 as follows:

Eqn. A-9: $FTF_f =$

$$\frac{((F_{NPBT,fYR,RF,T} + F_{NPBT,fYR,CD,T})/Rcpf_e) + F_{NPBT,fYR,CFC,T} + F_{NPBT,fYR,REC,T}}{((F_{NPBT,sYR,RF,T} + F_{NPBT,sYR,CD,T})/Rcpf_e) + F_{NPBT,sYR,CFC,T} + F_{NPBT,sYR,REC,T}}$$

Notes

1 Facility level factors are converted to Form level factors.
2 T subscript refers to managerial plus technical plus clerical labor.
3 $Rcpf_e$ refers to *Equivalent Form R Chemicals per Facility* (see Appendix B Supplement).

The FTF_f of 2.1 has the following interpretation: "for any comparison of first-time filer to ongoing filer burden, the elevated startup effort is roughly twice the normal ongoing burden."

Cost Conversion

The Cost Conversion method involves developing a universal *WAWR* that incorporates fixed proportions of Managerial, Technical and Clerical labor categories at values of .03, .89. and .08 respectively and can be applied to *Form R burden, Form A burden* and *Steady State Total Burdens*. Similar to the burden estimate in Eqn A-3, for the cost estimate, the matrix calculation is reduced to the following weighted average unit cost per Form times the number of Forms:[8]

$$N_R * (F'' * \$)$$

Matrix System $N_R * (F'' * \$)$

$$N_R * \begin{vmatrix} \frac{F_{NPBT,sYR,RF,m}}{Rcpf_e} & \frac{F_{NPBT,sYR,RF,t}}{Rcpf_e} & \frac{F_{NPBT,sYR,RF,c}}{Rcpf_e} \\ \frac{F_{NPBT,sYR,CD,m}}{Rcpf_e} & \frac{F_{NPBT,sYR,CD,t}}{Rcpf_e} & \frac{F_{NPBT,sYR,CD,c}}{Rcpf_e} \\ F_{NPBT,sYR,CFC,m} & F_{NPBT,sYR,CFC,t} & F_{NPBT,sYR,CFC,c} \\ F_{NPBT,sYR,REC,m} & F_{NPBT,sYR,REC,t} & F_{NPBT,sYR,REC,c} \end{vmatrix} * \begin{vmatrix} \$/hr & \$/hr & \$/hr \\ \text{managerial} & \text{technical} & \text{clerical} \end{vmatrix}$$

[7] EA's report incremental burden associated with proposed changes; since non-Form burden components are constant, they do not vary with changes in forms, yielding a zero effect in this context.

[8] The existing method has been modified for ease of presentation. In practice, no devisor is used but rather, facility burden is multiplied by the number of facilities and form burden is multiplied by the number of forms. Total facility and form burden are then summed to equal total burden reported by Form R.

Eqn. A-10: Form R Costs = $((N_R \sum_{i=1}^{4}(\sum_{j=1}^{4} F''_{i,j})* \$_j))$

Rearranging this equation to a *Weighted Average Wage Rate* (*WAWR* in current $/hr) from which hours can be readily converted to cost (for Form R related burden) yields:

Eqn. A- 11: *Form R Costs = Form R Burden * WAWR*

Generalizing to the overall equation:

Eqn. A-12: *Steady State Total Cost = Steady State Total Burden * WAWR*

Intuitively, one would state this equation as follows: "the total steady state cost estimate is the product of total burden times the weighted average $/hr labor rate." The current *WAWR* (June 2010)[9] of $49.62/hour has the following interpretation: "for every hour of incremental burden increased or decreased, the associated cost, on average, is $49.69 per hour." W*AWR* provides a universal conversion factor for all TRI key burden estimates, including Form R burden, Form A burden, and *Steady State Total Burden.*

Methodology Decision Rules Summary

This appendix presented the conceptual bases for the new RBBM, including the generalized steps by which the existing methodology's system was restructured and simplified. In the process of restructuring and simplifying, certain key development decision rules (summarized in main report, p. 10) were established, including:

- Rule 1: Derive Form A burden from Form R burden using estimates of burden by activity —This decision rule, used in the *A/R* model, ensures transparency and internal consistency by using the subset of tasks from Form R reporting that similarly apply to Form A reporting.
- Rule 2: Use Form R basis where additional complexity for Form A basis is unmerited—This decision rule, used in the FTF_f and *WAWR* models, provides universal models across Form A, Form R, and total burdens.
- Rule 3: Make simplifying assumptions where they are mathematically justified—This decision rule is used in the *A/R* model in the context of the decision to exclude first-time filer effects from models from the Steady State Burden Calculation. The rule is also used in applying the *WAWR* universally across Form R, Form A, and total burden estimates.
- Rule 4: Make simplifying assumptions where a distinction is not backed up by quantitative and/or statistical evidence (especially when the need for evidence is expressed by stakeholders)—This decision rule was used to set the value of the ratio model for *PBT/non-PBT* burden equal to one.
- Rule 5: When scaling from form element estimates to *Nominal Form R unit burden*, scale elements equally, in proportion to their contributions to the total—This decision rule was used in developing Standardized Form Element Burdens.

[9] Wage data source: http://www.bls.gov/ncs/ect/#tables

- Rule 6: Back-calculate the Form R unit burden in order to maintain the established baseline's total burden—This decision rule was used to set the starting value for *Nominal Form unit burden*.

Appendices B-E present method development, including detailed analyses used to formulate and refine distinct pieces of the overall methodology. These appendices, organized by each of the constituent methods, comprehensively detail models and computational procedures of the methodology. Additionally, key analytical decisions are discussed with assumptions validated using empirical evidence where possible.

Figure A-2: Standardized Data Element Time Estimates Scaled to 35.7 Hours

(IMPORTANT: Type or print; read instructions before completing form)

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EPA
United States Environmental Protection Agency

FORM R

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also Known as Title III of the Superfund Amendments and Reauthorization Act

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

WHERE TO SEND COMPLETED FORMS: 1. TRI Data Processing Center P. O. Box 1513 2. APPROPRIATE STATE OFFICE (See instruction in Appendix E)

This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave bank.

Revision (enter up to two codes(s)) ☐ ☐ **Withdrawal (enter up to two code(s))** ☐ ☐

IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART 1. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 0.006 hours

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? 0.006 hours		**2.2**	Is this copy ☐ Sanitized ☐ Unsanitized Answer only if "YES" in 2.1 0.006 hours
	☐ Yes (Answer question 2.2; Attach substantiation forms)	☐ No (Do not answer question 2.2; Go to Section 3)		

SECTION 3. CERTIFICATION **(Important: Read and sign after completing all form sections.)**

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
NA	NA	

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number 0.002 hours

Facility or Establishment Name 0.002 hours	Facility or Establishment Name or Mailing Address (If different from street address) 0.002 hours	
Street 0.002 hours	Mailing Address 0.002 hours	
City/County/State/Zip Code 0.002 hours	City/County/State/Zip Code 0.002 hours	Country (Non-US) 0.002 hours

4.2	This report contains information for: 0.006 hours (Important: Check c or d if applicable) a. ☐ an entire facility b. ☐ Part of a facility c. ☐ a Federal facility d. ☐ GOCO		
4.3	Technical Contact Name	0.002 hours	Telephone Number (include area code) 0.002 hours
	Email Address	0.002 hours	
4.4	Public Contact Name	0.002 hours	Telephone Number (include area code) 0.002 hours
	Email Address	0.002 hours	

4.5	NAICS Code(s)	Primary a.0.002 hours	b.	c.	d.	e.	f.
4.6	Dun & Bradstreet Number (s) (9 digits)	a. 0.002 hours					
		b.					

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	**NA** ☐	0.002 hours
5.2	Parent Company's Dun & Bradstreet Number	**NA** ☐	0.002 hours

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FORM R

PART II. TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

	TRI Facility ID Number
	Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY **(Important: DO NOT complete this section if you completed Section 2 below.)**

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical
	0.002 hours
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
	0.002 hours
	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)
1.3	0.002 hours

SECTION 2. MIXTURE COMPONENT IDENTITY **(Important: DO NOT complete this section if you completed Section 1 above.)**

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces and punctuation.) 0.002 hours

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical: 0.002 hours	**3.2** Process the toxic chemical: 0.002 hours	**3.3** Otherwise use the toxic chemical: 0.002 hours
a. ☐ Produce b. ☐ Import		
If produce or import	a. ☐ As a reactant	a. ☐ As a chemical processing aid
c. ☐ For on-site use/processing	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
d. ☐ For sale/distribution	c. ☐ As an article component	c. ☐ Ancillary or other use
e. ☐ As a byproduct	c. ☐ Repackaging	
f. ☐ As an impurity	c. ☐ As an impurity	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON SITEATANY TIME DURING THE CALENDAR YEAR

4.1	0.944 hours	(Enter two digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter a range code** or estimate)	**B. Basis of Estimate** (enter code)	**C. % From Stormwater**
5.1	Fugitive or non-point air emissions	**NA** ☐ 0.005 hours	3.264 hours	0.010 hours	
5.2	Stack or point air emissions	**NA** ☐ 0.005 hours	1.879 hours	0.010 hours	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	0.008 hours		1.881 hours	0.010 hours	0.416 hours
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box, ☐
and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

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*For Dioxin or Dioxin-like compounds, report in grams/year.
** Range Codes: A= 1-10 pounds; B= 11-499 pounds; C= 500-999 pounds.

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(IMPORTANT: Type or print; read instructions before completing form)

FORM R

PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ON SITE (continued)

		NA	A. Total Release (pounds/year*) (enter range code ** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	☐ 0.005 hours	1.881 hours	0.010 hours
5.4.2	Underground Injection onsite to Class II-V Wells	☐ 0.005 hours	1.881 hours	0.010 hours
5.5	Disposal to land onsite			
5.5.1A	RCRA Subtitle C landfills	☐ 0.005 hours	1.810 hours	0.010 hours
5.5.1B	Other landfills	☐ 0.005 hours	1.810 hours	0.010 hours
5.5.2	Land treatment/application farming	☐ 0.005 hours	1.881 hours	0.010 hours
5.5.3A	RCRA Subtitle C surface impoundments	☐ 0.005 hours	1.810 hours	0.010 hours
5.5.3B	Other surface impoundments	☐ 0.005 hours	1.810 hours	0.010 hours
5.5.4	Other disposal	☐ 0.005 hours	1.810 hours	0.010 hours

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1 Total Transfers (pounds/year*) (enter range code ** or estimate)	**6.1.A.2 Basis of Estimate** (enter code)
1.881 hours	0.010 hours

6.1.B_____ POTW Name	0.008 hours						
POTW Address	0.008 hours						
City	0.008 hours	State	0.008 hours	County	0.008 hours	Zip	0.008 hours
6.1.B_____ POTW Name							
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages

in this box ☐ and indicate the Part II, Section 6.1 page number in this box ☐ (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2._____ Off-Site EPA Identification Number (RCRA ID No.)	0.008 hours								
Off-Site Location Name	0.008 hours								
Off-Site Address	0.008 hours								
City	0.008 hours	State	0.008 hours	County	0.008 hours	Zip	0.008 hours	Country (Non-US)	0.008 hours

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* For Dioxin or Dioxin-like compounds, report in grams/year ** Range Codes: A=1-10 pounds: B=1-499 pounds; C=500 - 999 pounds.

Is location under control of reporting facility or parent company? ☐ Yes ☐ No 0.008 hours

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FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
Toxic Chemical, Category or Generic Name

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (CONTINUED)

A. Total Transfers (pounds/year*) (enter range code**or estimate)	**B. Basis of Estimate** (enter code)	**C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery** (enter code)
1. 1.810 hours	**1.** 0.010 hours	**1 . M** 0.010 hours
2.	**2.**	**2 . M**
3.	**3.**	**3 . M**
4.	**4.**	**4 . M**

6.2_____ Off-Site EPA Identification Number (RCRA ID No.)

Off-Site Location Name

Off-Site Address

City | State | County | Zip | Country (Non-US)

Is location under control of reporting facility or parent company? Yes ☐ No ☐

A. Total Transfers (pounds/year*) (enter range code**or estimate)	**B. Basis of Estimate** (enter code)	**C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery** (enter code)
1.	**1.**	**1 . M**
2.	**2.**	**2.M**
3.	**3.**	**3.M**
4.	**4.**	**4.M**

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ Not Applicable (NA) Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category

a. General Waste Stream [enter code]	b. Waste Treatment Method(s) Sequence [enter 3- or 4- character code(s)]								d. Waste Treatment Efficiency [enter 2 character code]
7A.1a	**7A.1**	1		2		3		4	**7A.1d**
0.162 hours	5	0.648 hours	6		7		8		0.416 hours
7A.2a	**7A.2**	1		2		3		4	**7A.2d**
	5		6		7		8		
7A.3a	**7A.3**	1		2		3		4	**7A.3d**
	5		6		7		8		
7A.4a	**7A.4**	1		2		3		4	**7A.4d**
	5		6		7		8		
7A.5a	**7A.5**	1		2		3		4	**7A.5d**
	5		6		7		8		

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box ☐

and indicate the Part II, Section 6.2/7 page number in this box: ☐ (example: 1,2,3,etc.)

*For Dioxin or Dioxin-like compounds, report in grams/year

**Range Codes: A=1 - 10 pounds; B=11 - 499 pounds C= 500-999 pounds.

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FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
Toxic Chemical, Category or Generic Name

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) – 0.005 hours Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)] 0.648 hours

1 [ ] 2 [ ] 3 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) – 0.005 hours Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)] 0.648 hours

1 [ ] 2 [ ] 3 [ ]

SECTION 8. SOURCE REDUCTION AND RECYLING ACT IVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1					
8.1a	Total on-site disposal to Class I Underground InjectionWells, RCRA Subtitle C landfills, and other landfills	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.1b	Total other on-site disposal or other releases	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.1d	Total other off-site disposal or other releases	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.2	Quantity used for energy recovery onsite	0.009 hours	0.856 hours	0.030 hours	0.030 hours
8.3	Quantity used for energy recovery offsite	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.4	Quantity recycled onsite	0.009 hours	0.856 hours	0.030 hours	0.030 hours
8.5	Quantity recycled offsite	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.6	Quantity treated onsite	0.009 hours	0.856 hours	0.030 hours	0.030 hours
8.7	Quantity treated offsite	0.009 hours	0.146 hours	0.030 hours	0.030 hours
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)*			0.146 hours	
8.9	Production ratio or activity index	0.944 hours			
8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.				

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	0.648 hours	**a.** 0.010 hours	**b.**	**c.**
8.10.2		**a.**	**b.**	**c.**
8.10.3		**a.**	**b.**	**c.**
8.10.4		**a.**	**b.**	**c.**

8.11 If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, check "Yes." Yes ☐ 0.000 hours

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*For Dioxin or Dioxin-like compounds, report in grams/year

*Range Codes: A=1 - 10 pounds; B=11 - 499 pounds C= 500-999 pound

4/28/11

Appendix B

Steady State Total Burden Calculation

This appendix presents and justifies the primary method of Ratio-Based Burden Methodology (RBBM)—the Steady State Total Burden Calculation, including details of its development.

As stated earlier, *Steady State Total Burden* is the estimate of the ongoing TRI Program burden, as updated by rulemakings' permanent impacts, but absent any first-time filer impacts. Recall from (Eqn. A- 5) of Appendix A:[1, 2, 3]

Steady State Total Burden = Form R burden + Form A burden + Non-Form burden

Where:

- *Form R Burden = (# Form R chemicals) * (Nominal Form R unit burden)*
- *Form A Burden = (# Form A chemicals) * (A/R) * (Nominal Form R unit burden)*
- *Non-Form Burden*
  = (Supplier Notification) + (Non-Reporter Compliance Determination) + Petitions

And:

A/R=	Ratio model of single-chemical Form A unit burden to Form R unit burden
Nominal Form R Unit Burden=	Single base number for the entire methodology; provides the focal point for assessing and maintaining estimate accuracy

The components of this method include Form burden (*A/R* model and *Nominal Form R unit burden*) and non-Form burden (petitions, supplier notification, and non-reporter compliance determination). An important note about this method is the way its components support the overarching methodology priorities of simplicity, internal consistency, and transitional baseline continuity. The *A/R* model ensures internal consistency between Form R and Form A unit burdens, and ultimately between total burdens for Form R and Form A chemicals. The *Nominal Form R unit burden* is computed with two purposes in mind: to provide a seamless transition from old to new methodology and to serve as the one point for adjustments and updates.

The first section of this appendix presents the existing system's relevant characteristics and explains why the new structure was chosen. This section is followed by a series of discussions on method development for several models. These discussions include, as part of the relevant *A/R* model specifications, the substantive simplifications including: 1) neglect the effects of first-time filers in steady state burden estimates, and 2) set the value of *PBT/non-PBT* model equal to one.

[1] This model also applies to estimates of incremental burden associated with a proposed policy or regulatory change. In that case, the number of forms in the equation would represent the incremental number of forms associated with the proposed change.

[2] Note that the method's formulation incorporates simplifications: a) Neglect the effect of first-time filers in the steady state, and b) set the ratio model for PBT to non-PBT burden equal to one.

[3] For purposes of modeling, EPA refers to "Form R Chemicals" and "Form A Chemicals" in order to provide a consistent metric across form types. In practice Form R reports contain one chemical per report and Form A allows multiple chemicals (2.3 on average).

Additionally, the details for specifying non-Form burden and for back calculating *Nominal Form R unit burden* are provided.

This appendix does not address burden estimation associated with new Form elements, or related procedures for updating *Nominal Form R unit Burden*, as these topics are covered as a separate method in Appendix C. Similarly, as first-time filers are not included in RBBM's formulation of the Steady State Total Burden Calculation; that estimation, for calculating first-time effects in rulemakings, is covered as a separate method in Appendix D.

Changes to an Existing System: Adding Simplicity and Internal Consistency

Two aspects of the existing methodology focused RBBM's design. It was overly complex and it lacked internal consistency (see discussion in this document's main report). In order to provide internal consistency, EPA redesigned the Steady State Burden Calculation to incorporate ratio models (discussed in next section). In order to simplify, EPA developed the Steady State Burden Calculation which requires a minimum number of variables (discussed further here).

The overarching simplification in RBBM is to algebraically reduce a complex matrix system, as described in Appendix A. As an essential step in that simplification, EPA re-scaled facility-level factors to (per chemical) form-level factors. EPA derived *Equivalent Form R/A Chemicals per Facility* based on the distributions of Form R and Form A chemicals within and across facilities (see Appendix B Supplement – Distribution Analysis for details). In addition to providing simplification, the re-scaled factors prevent double-counting facility-level burden.

Under the existing methodology, double-counting potential occurs in two variants. First, when total Form A and Form R burdens are estimated, both estimates count the burden for those facilities filing both A and R chemicals. Second, when a new chemical is reported by a facility, the incremental burden associated with the new chemical report does not discount for the fact that the facility may already be filing other chemical forms. With RBBM, facility-level burden is apportioned across (per chemical) form-level unit burdens, so that facility-level burden is now accounted for on a "by chemicals" basis, with each chemical's burden only counted once each.

As a secondary benefit of uniformly scaled factors, the RBBM form-level estimates are "fully loaded" to incorporate all aspects of TRI reporting. For this reason, the resultant unit burdens (Form R and the related Form A single-chemical) are comprehensive, preventing the need to track multiple unit burdens for form and facility. Similarly, the Standardized Form Element Burdens contain incremental elemental estimates that similarly incorporate all associated burden (discussed in Appendix C).

As another essential step in the overarching simplification of algebraic reduction, EPA imposed substantive simplifications to the Steady State Total Burden Calculation by: 1) neglecting the effects of first-time filers in steady state burden estimates, and 2) setting the *PBT/non-PBT* model's ratio value equal to one. The first simplification is justified mathematically, as treating the relevant 3% of TRI chemical reports as steady state filers instead of first-time filers decreases

the total steady state burden by .04%.[4] The second simplification is justified due to the absence of an evidence-based verifiable alternative (see discussion section on the *PBT/non-PBT* model).

These simplifications, as adjustments to the overall burden calculation, improve the methodology in two ways. First, they keep the equation simple. Had these simplifications not been made, the Calculation would have required tracking subpopulations of PBT chemical filers and first-time filers, making the method more complex. As it now stands, only two input variables are required—number of Form R chemicals and number of Form A chemicals. A second benefit from these simplifications is the sophistication of a single unit burden for *Nominal Form R unit burden* with Form A reporting burden closely linked (see further discussion in *Justification: Back-Calculated Nominal Unit Burden*).

Moving from Implicit to Explicit Ratios

Table B-1 provides the unit burdens and effective ratios embedded in the existing system. As described in the main report, the A/R is .64 across PBT and non-PBT chemicals. Similarly, the ratio for PBT/non-PBT is 1.73 across Form R and Form A chemicals.

Table B-1: Summary of Form-Based Unit Burdens from Existing Methodology

	Subsequent Year Burden Hours per Single Chemical Form* A/R=.64; PBT/non-PBT=1.73	
	Non-PBT	PBT
Form R	29.66	51.34
Form A (single chemical)**	20.52	35.89 (no longer valid as PBTs may not be reported on Form A)
*excludes facility-level burden for compliance determination **single chemical Form A is used in unit burden comparisons, although multiple chemicals may be reported on Form A (about 2.3 on average)		
Source: Toxics Release Inventory TRI Form R Toxic Chemical Release Reporting Information Collection Request Supporting Statement OMB Control Number 2070-0093 EPA ICR #1363.15. December 10, 2007.		

In the case of *A/R*, the current ratio of .64 for Form A to R burden[5] is very close to RBBM's value of .615. However, with the Form A to Form R burden very different from the ratio of form pages of .25, the ratio value needed to be more readily verifiable. Upon inspection, EPA concluded that the reason for the apparently high ratio is due to labor-intensive calculations required to determine Form A eligibility that are made regardless of final decision on Form type. Using RBBM, the detailed estimates of the Abt Associates Engineering Studies substantiate this finding with *A/R* burden estimated at .615. RBBM estimates Form A burden based on detailed

[4] Based on 2008 ICR (RY 2007) chemical counts and models, see *Findings* under *A/R Model* in this Appendix.
[5] For details and context for the A/R value of .64, see: Rice, Cody. 2004. Terms of Clearance for TRI ICR Renewal. Regulations.gov. Accessed 23 Dec 2010 <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OEI-2004-0006-0004>Additional references include: 1) the Regulatory Impact Analysis of the EPCRA Section 313 Alternate Threshold Final Rule, Regulatory Impacts Branch, Economics, Exposure and Technology Division, Office of Pollution Prevention and Toxics, US Environmental Protection Agency, November 18, 1994 and 2) memo from Cody Rice (USEPA/OEI) to Amy Newman (USEPA/OEI) re: Terms of Clearance for TRI ICR Renewal, January 20, 2004. Sources used to derive the .64 figure included 1) the original TRI Regulatory Impact Analysis, 2) the Pollution Prevention Act EA for the proposed rule from 1991, and 3) the 1/20/2004 Terms of Clearance Memo.

analysis of common tasks between Form A and Form R.[6] The RBBM approach to the *A/R* model ensures internal consistency and provides verifiable unit burdens, thereby increasing transparency.

Regarding the ratio of PBT/non-PBT burden, the existing system's ratio unintentionally resulted from discussions aimed at lowering totals with the decision to make a downward adjustment to non-PBT unit burden, while holding PBT unit burden constant.[7] Under these circumstances, the resultant ratio of 1.73 occurred as an offshoot of the revision process, rather than as a deliberate specification. This value of 1.73 is very different than the "null" assumption of 1.0, leaving the basis vulnerable to questions such as: Given the rationale that PBT chemical reporters incur greater burden because they cannot use the *de minimis* exemption, how much greater should the ratio be? How should the ratio be determined? Is there sufficient evidence to support the 73% difference? Ideally, quantitative evidence obtained via representative sampling would provide information on overall average conditions for TRI reporters. Regarding RBBM's *PBT/non-PBT* ratio model, EPA sought to specify a ratio value in a manner that would produce internally consistent and verifiable unit burdens.[8]

Justification: Ratio Models with Engineered Building Blocks

As the name implies, ratio models are central to RBBM's design. As often as possible, EPA formulates ratio models in order to characterize key relationships around which it wants to ensure internal consistency. In this appendix, EPA uses *A/R* and *PBT/non-PBT* models; see also Standardized Form Element Burdens, *FTF,* and *WAWR* models. The ratio structure has a number of advantages:

- Ratios, as a type of measure, possess an absolute zero requiring less maintenance than measures of the components separately.
- Ratio models themselves have intrinsic value, providing useful standalone metrics as they quantify key relationships between two elements.
- Ratio models are inherently more stable and therefore more robust to changes than their component variables.

Moreover, RBBM's ratio models provide assurances that unit burdens are internally consistent and verifiable because:

- Ratio models specify internal relationships.
- The bases for the ratio models (*A/R, FTF, WAWR*) are quantitatively derived.

[6] Note that the burden required to determine eligibility to use Form A (as described here) is not the same as the burden required to determine whether or not the Section 313 reporting requirements apply to a facility in general. Form A eligibility is based on whether, on a per chemical basis, a facility has less than 500 lbs of total annual reportable amount and that amounts manufactured, processed or otherwise used do not exceed one million lbs.

[7] For details, Rice, Cody. 2004. Terms of Clearance for TRI ICR Renewal. Regulations.gov. Accessed 23 Dec 2010 <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OEI-2004-0006-0004>.

[8] Ultimately, in RBBM the *PBT/non-Pbt* value is specified as one. Note, however, that the higher PBT reporting burden from the existing methodology is incorporated into RBBM's *Nominal Form R unit burden's* starting value of 35.7 hours/Form R. See discussion in *Justification: Back-Calculated Nominal Unit Burden* section.

Regarding the robustness, RBBM's ratio models are robust due to the inherent stability of relationships that they characterize, as well as stability of related assumptions. For example, in the technology advances by which reporting shifted from primarily paper to electronic submission, the relationship between Form A burden and Form R burden remained largely unchanged and of the same ratio, while the magnitude of total reporting burden was estimated to decrease. This ratio remains stable because the changes to Form R and Form A impose similarly small incremental burden changes to both the numerator and the denominator of the ratio, thus causing the ratio itself to remain roughly constant. Note, however, that in the event that the Form R and/or Form A undergo extreme revisions that alter the relationship between *A/R* burden, then the *A/R* model would require updating.

EPA developed RBBM's ratio models based on existing work and best available information. Detailed burden estimates from the Abt Associates Engineering Studies are employed as computational components of RBBM ratio models (see Appendix G for these studies). In these studies, Abt Associates provided expertise for each study using a team of three staff with nearly 40 years of combined experience working with facilities on environmental issues. These staff members had worked with hundreds of facilities on TRI reporting and other environmental requirements. They had conducted inspections and provided technical assistance, served as TRI trainers, conducted technical review on hundreds of TRI data withdrawal requests, conducted hundreds of TRI data quality calls, worked for two of the Massachusetts Toxics Use Reduction Act agencies, and worked as environmental staff at large manufacturing facilities. In short, the authors have a thorough understanding of what is required in reporting, especially with regard to the relative burden associated with each task in relation to others. The authors' knowledge base was tapped to evaluate burden consistently across reporting activities and develop a systematic set of burden estimates.

The Abt Associates Engineering Studies themselves provide estimates of burden by activity, with the "calculation and Form completion" activity broken down to element-by-element estimates. This means that for each element of a Form R, the authors evaluated the calculations/tasks involved and estimated burden. Moreover, within the Form R, the authors assessed how frequently a response was provided for each element, and adjusted the element burden by incidence weights.[9]

Given the strengths of internal validity and internal consistency, the Abt Associates Engineering Estimates are used as building blocks for ratio models in RBBM. Additionally, since these estimates were derived after the TRI program underwent numerous technology advances, EPA concludes that, on a relative basis, these estimates reflect updated and more current conditions than those made at TRI program inception. EPA recognizes that the information from the Abt Associates Engineering Studies drew from a non-representative sample of TRI reporters[10], and consequently uses the estimates to develop ratio models of relative relationships but not for absolute measures (e.g. Form R compliance determination). Additionally, use of the Abt Engineering estimates provides a means by which *A/R* and other models may be verified. For

[9] The incidence rate was calculated using the frozen RY 2002 TRI data. All but one method of the RBBM use this version of unit burdens (in models *A/R, FTF, WAWR*). The exception is the set of Form Element Burden Estimates, for reasons described in Appendix C.

[10] Note that this weakness does not pose problems in the context of designing ratio models reflecting relative relationships; it is more problematic when revising absolute values for unit burdens.

justifications of the values assigned to the specific ratios see detailed sections on the ratio models themselves in this and other appendices.

Justification: Back-Calculated Nominal Unit Burden

RBBM's base unit burden, *Nominal Form R unit burden* is a base number for the entire methodology. Due to the simplifications described above, it provides a comprehensive single focal point for discussions about methodology accuracy. For routine adjustments, such as Form R revisions, estimates for increases or decreases in burden associated with the particular form changes are applied to the *Nominal Form R unit burden*, with related changes automatically propagated through the RBBM system via ratio models (e.g., to Form A, and for first-time filers). As an additional RBBM feature, with the ratio models addressing key internal relationships, *Nominal Form R unit burden* reflects overall average conditions for all remaining unspecified effects, removing the need to revise the methodology by adding variables.[11]

EPA considered the question: How should the value of the base unit burden be set? From the Abt Associates Engineering Studies, one could ask, why not just sum up the Form R element-by-element estimates to set the value for the Form R unit burden of 7.06 hours? Instead, RBBM sets the base unit burden based on the back-calculated number—35.7 hours per Form R—that preserves the same total burden, assuming constant levels of Form R and Form A chemical counts.

In managing the transition to RBBM, EPA placed priority on ensuring transitional baseline continuity. This requirement preserves the baseline of total burden at its existing level, with RBBM estimates starting at the point from which prior estimates left off. Note that EPA defines the methodology revision's transition point as the time of the last ICR approval.[12] Thereafter updates are to be made according to RBBM, either via wholesale changes to the *Nominal Form R unit burden*, or by making incremental changes to it using Standardized Form Element Burdens. Given the simplified Steady State Total Burden Calculation, with the *A/R* key relationship modeled and the total burden fixed, the only variable left unspecified is the base unit burden. The resultant back-calculated value is 35.7 hours, and the variable is termed *Nominal Form R unit burden*.

EPA refers to the back-calculated number as the *Nominal Form R unit burden* because it is a base number without exact derivation from rigorous modeling. Mathematically, it represents the Form R, non-PBT, subsequent year unit burden. In practice it serves as a proxy for overall average conditions for all Form R's (with Form A burden closely linked at 61.5% of that unit burden). As noted above in the previous discussions on overarching simplifications, this unit burden incorporates facility-level burdens, comprehensively reflecting all aspects of relevant TRI reporting.[13]

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[11] In this Appendix, the discussion has mainly focused on the *PBT/non-PBT* and first-time filer effects because they were part of the previous methodology. The broader argument stated here applies to other unmodeled effects, such as ongoing staff turnover.

[12] Based on 2007 projections, see TRI 2008 ICR Supporting Statement.

[13] Note also that Standardized Burden Element Burdens (See Appendix C), used to update the *Nominal Form R unit burden* in the event of form changes, are also comprehensive (i.e.,"fully loaded") and internally consistent with the base unit burden.

As a reflection of overall average Form R unit burden, RBBM's *Nominal Form R unit burden* carries forward certain prior assumptions from the existing methodology without explicitly modeling them. In particular, note that the higher PBT reporting burden for 20% of Form Rs is incorporated into the *Nominal Form R unit burden's* starting value of 35.7 hours/Form R, which is elevated above the value that would have been otherwise obtained—at about 30 hours/form—had only non-PBT burden been used to determine *Nominal Form R unit burden*.[14]

EPA supports this value of 35.7 hours per Form R as a reasonable approximation of the actual unit burden, based on years of review and scrutiny to which the current total burden estimate has been subjected. The unit burden of 35.7 hours, in the context of a new system of ratio models, is the culmination of prior accuracy assessments, including a 49% decrease to the baseline in the 2004 ICR Renewal.[15] Therefore, this basis is legitimized for ultimately setting the magnitude of the Program total burden at this time.

Method Development

In this section, EPA describes the development work and model-specific justifications for the key components for the Steady State Total Burden Calculation. The section covers models for Form Burden and constants for non-Form Burden. The back-calculated unit burden is presented last, because it is specified last.

PBT/Non-PBT Model

The PBT/non-PBT model specifies unit burden for PBT chemicals with respect to non-PBT chemicals. In this methodology, the value of this ratio is set equal to one:

Ratio of Form R PBT Unit Burden to Form R non-PBT Unit Burden	*[=]*	$\frac{\text{Hours per PBT Form R}}{\text{Hours per non-PBT Form R}}$

Unlike most analytical decisions in the revised methodology, the decision to set the *PBT/non-PBT* equal to one is based on the lack of evidence. It is an assertion of a null hypothesis out of concern that the existing system's specification of 1.73 is unverifiable and could produce internal inconsistencies. EPA concludes that in the event that a reasonable person asks: Why would a PBT chemical require 73% more burden, on average than a non-PBT chemical? EPA should

[14] Note from Table B-1 that form-level burden is 29.66 hours per Form R chemical. Adding facility level burdens totaling 4 hours per facility, and given that each reporting facility manages about 4 Form R chemicals, yields the rough estimate of 30 hours per non-PBT Form R chemical.

[15] As an overall 57% downward adjustment, the TRI Program burden estimate was decreased from 6.03 million to 2.61 million hours according to Notices of OMB Action (called Paperwork Reduction Submissions) for Form R ICR and Form A ICR. Submitted October 27, 2003. Approved January 9, 2004. Based on the TRI 2004 ICR Supporting Statements, there were four sources (with relative contributions): 1) reducing non-PBT subsequent year burden from 47.1 to 14.5 hours (85.95%), 2) correcting the previous ICR due to Lead Rule implementation (6.37%), 3) changes to actual reporting from previous ICR (.24%) and 3) a one-time adjustment for *TRI-ME* (7.44%). This yields a 49% decrease in total burden associated with the methodology change from the first source.

have a concrete, evidence-based response. In the absence of such quantitative evidence, the fallback position was chosen.

This question has been extensively debated. On one side, public comments from industry express concern about additional burden due to additional demands related to PBT reporting requirements. One the other side, Abt Associates Engineering Studies find no substantial bases for differences. Table B-3 provides the arguments on both sides. Regardless of credibility on either side, both of which are compelling, neither position offers strong evidence of the most likely average relationship representative of the TRI reporting population. EPA concludes that the ratio of PBT to non-PBT reporting burden cannot be determined analytically using the readily available information.

As an important qualifier, even though the ratio value for the model for *PBT/non-PBT* is set equal to one, the overall Steady State Burden Calculation carries forward the elevated level of burden related to the prior assumptions of higher PBT unit burden from the existing methodology while not explicitly modeling the effect (see discussion earlier, under *Justification: Back-Calculated Nominal Unit Burden*).

Table B-3: PBT Chemical Reporting Burden relative to non-PBT Chemicals

Industry Comments	Abt Associates Engineering Studies
SUMMARY Special conditions of PBT reporting, including no *de minimis* exception and no range reporting create higher burden for PBT reporting.	SUMMARY Activities required for reporting PBT and non-PBT chemicals are similar enough that the same unit burden hour estimate should be used.
PBT reporting requires additional research, inquiries of suppliers not required to provide notification of *de minimis* levels of PBT chemicals, additional calculations for compliance determinations, additional calculations for Form R completion and recordkeeping (extra burden associated with obtaining and managing the relevant data).	1) It does not appear, however, that the lack of the *de minimis* exemption will increase the burden associated with making release estimates due to a need to assess additional waste streams. 2) Also, not being able to use range reporting does not actually increase the reporting burden for PBT filers. Even though range reporting is allowed for non-PBT chemicals in Part II, Sections 5 and 6 of the Form R, it is not allowed for same data elements in Part II, Section 8. As a result, no fewer calculations are necessary to complete a Form R for non-PBTs versus PBTs due to range reporting.
Requires facilities to report PBT chemicals to a precision level of .1 lbs for lead or .0001 grams for dioxins; large number of facilities reporting one pound or less; median lead release for all reporters is one pound.*	
*Lead and Lead Compounds Form R reports constitute about 55% of PBT chemical reports (and PBTs constitute about 20% of total TRI chemical reports)—measured by average percentages in period between 2004-2007 in Frozen TRI data for RY 2007	

Sources:
1) Industry comments drawn from comment documents in docket #OEI-2003-0025 for EPA ICR No. 1363.12 and EPA ICR 1363.13;in docket # OEI-2004-0006 for EPA ICR 1363.14; and from docket # TRI-2007-0355, EPA ICR 1363.15

Abt Associates Engineering Studies (provided in Appendix G) based on development of Realistic Burden Estimates for Total Form R Completion (also see description of these models in this Appendix's "Justification: Ratio Models with Engineered Building Blocks").This analysis was conducted separately for non-PBT and PBT chemicals

In conclusion, EPA recommends the value for the *PBT/non-PBT* model of 1.0 hr/hr.

A/R Model

Given the decision to set *PBT/non-PBT* equal to one, the next question to address in developing the Steady State Total Burden Calculation is: how to set the A/R ratio value? The A/R model specifies the unit burden for Form A as a function of its components common to Form R, defined by:

Ratio of Form A Unit Burden to Form R Unit Burden	*[=]*	*Hours per Single-Chemical Form A / Hours per Form R*

Computed using the factor matrices for Form R and Form A (as derived from Form R)[16] presented in Appendix A:

$$A/R = \left(\sum_{i=1}^{4}\sum_{j=1}^{3} [\text{A factors from } F''_{i,j}]\right) / \left(\sum_{i=1}^{4}\sum_{j=1}^{3} [F''_{i,j}]\right)$$

In A/R model building, EPA ensures internal consistency between Form A and Form R. When specifying the set of Form R activities similarly applicable to Form A, the factor for calculations and form completion is based on the burden involved in Form A eligibility determination (including half of Form R's Section 5 and 6 work) plus all the tasks associated with Form R elements that also occupy Form A. This level of detail was provided via the rigor of the Abt Associates Engineering Studies. See Appendix A's Table A-4 for calculation results for *A/R* components, according to Form R and Form A. Also see Table A-5 for a comparison of relative contributions from the various activities across Forms.

The design of this model required the following steps:[17]

1. Rescale facility-level factors to form-level factors.
2. Reduce the factor matrices to sums for each Form A and Form R.
3. Compute the ratio of Form A to Form R burden.
4. Verify simplifying assumptions.

[16] Where *i* denotes the row and *j* denotes the column from the Matrix F″ in Appendix A.

[17] See Appendix A for an overview of the derivations and page 10 of the main report for an overview of the decision rules.

5. Assess model robustness to shifts in distributions of Form R and Form A chemicals within and across facilities.

The key analytical decisions for developing this model include:

1. Deriving *Equivalent Form R/A Chemicals per Facility* for use in rescaling facility-level factors to (per chemical) form-level factors (covered in Appendix B Supplement).
2. Determining how to translate the burden estimates for Form elements in Form R to corresponding estimates for Form A.
3. Where possible, confirming simplifying assumptions.

Testing the A/R Model

Table B-4 presents the results of the tests that support EPA's analytical decisions to incorporate distributional effects in rescaling, to neglect the effect of first-time filers, and to employ the most rigorous version of Abt Associates' estimates (incidence weighted engineering estimates).

Column (1) shows the reference case, which is the most complex model without any simplifications. The reference case has the following attributes:

- Incorporates first-time filer effects
- Uses the most rigorous version of the Abt Associates Engineering Studies' estimates (incidence-weighted "Realistic" estimates)
- Rescales using *Equivalent Form R/A Chemicals per Facility.*

Each model run as shown in Columns (2) through (4) removes complexities one at a time to support the recommended model in Column (5) which accepts only one simplification—to neglect first-time filers.[18] Additionally, Column (6) provides a robustness test that shows how much modeling error would be incurred if circumstances changed to a dramatically different distribution of Form Rs/Form As within and across facilities.[19]

[18] EPA expected negligible first-time filer effects on the steady state burden because first-time filers account for 2.87% of the total chemicals filed and 6.16 % of facilities (average percentages in period between 2004-2007 per Frozen TRI data for RY 2007 based on RY 2005).

[19] EPA used distributions from TRI Phase II burden reduction conditions (see details in Appendix B Supplement).

Table B-4: A/R Model Development Results and Analysis

Test Run Description	(1) REFERENCE no simplifications	(2) Same as (1) but without first-time filer adjustment	(3) Same as (1) but without incidence rate adjustments	(4) Same as (1) but without distribution specificity*	(5) RECOMMENDED realistic estimates with incidence rate adjustments**	(6) Robustness Test - alternate distribution ***
Model Form R unit Burden (hrs/Form R)	12.66	12.52	27.24	12.67	12.52	12.53
Model Form A unit burden (hrs/single chem Form A)	7.76	7.67	13.16	7.95	7.71	7.67
A/R	**0.613**	**0.612**	**0.483**	**0.628**	**0.615**	**0.612**
A/R % difference from Reference (Model Error)		-0.12	-21.22	2.41	0.39	0.50

* Does not account for potential double-counting of facility level burden among facilities reporting both Rs and As.
** Current A, R, A+R distributions, no first-time filer adjustments
*** Phase 2 Burden Reduction Rule

Findings

The recommended formulation of the *A/R* model with a value of .615 hr/hr, is robust to changes in model assumptions as well as changes in actual conditions, as simulated, yielding differences between *A/R* conditions and the *A/R* model under 0.5 %. Moreover, similar results are shown for the *Nominal Form R unit burden* in Table B-5—with a corresponding difference of 1%.

Regarding the practical need for distributional considerations, given the relatively small difference for *A/R* at 2.41%,[20] EPA considered making the additional simplification. However, with the conversion factors (*Equivalent Form R/A Chemicals per Facility*— $Rcpf_e$. $Acpf_e$) fundamental to RBBM overall, and integral to the development of several models *(A/R, FTF_f, WAWR)*, EPA examined the robustness of the conversion factors themselves. Table B-5 presents the result that even in the face of dramatic shifts in distribution, *Equivalent Form R/A Chemicals per Facility* are reasonably robust, within about 10%.

Taking a more comprehensive view, EPA calculates the effects of 1) neglecting first-time filers and 2) the alternate distribution on the *Steady State Total Burden* estimate. Regarding the assumption to neglect the effect of first-time filer in the steady state, EPA calculates the effect of modeling error on the *Steady State Total Burden* estimate at -.04% . Regarding the test for an alternate distribution, EPA calculates the associated error of encountering different conditions while using RBBM original models which results in an error of -.55% for *Steady State Total Burden.*

[20] The percent difference is calculated by taking the difference between the reference A/R model without distributional specificity and the reference A/R model divided by the reference A/R model [((0.628-0.613)/0.613) *100 =2.41%]. Note that figures have been rounded.

Table B-5: Nominal Form R Unit Burden and Equivalent Forms per Facility

Test Run Description	(1) REFERENCE no simplifications	(2) Same as (1) but without first-time filer adjustment	(3) Same as (1) but without incidence rate adjustments	(4) Same as (1) but without distribution specificity*	(5) RECOMMENDED realistic estimates with incidence rate adjustments**	(6) Robustness test - alternate distribution***
A/R	**0.613**	**0.612**	**0.483**	**0.628**	**0.615**	**0.612**
A/R % difference from Reference (Model Error)		-0.12	-21.22	2.41	0.39	0.50
Back Calculated Nominal Form R Unit Burden	**35.75**	**35.75**	**37.15**	**35.59**	**35.72**	**35.99**
Nominal Form R Unit Burden % difference from Reference (Model Error)		0.02	3.92	-0.43	-0.07	-0.77
Equivalent Form R chemical/facility	3.869	3.869	3.869	3.733	3.869	3.817
chemical/Form R % difference from Reference				-3.53	0.00	-1.35
Equivalent Form A chemical/facility	3.407	3.407	3.407	2.302	3.407	3.777
chemical/Form A % difference from Reference				-32.43	0.00	10.86

***** Does not account for potential double-counting of facility level burden among facilities reporting both Rs and As.
******Current A, R, A+R distributions, no first-time filer adjustments
******* Phase 2 Burden Reduction Rule

Non-Form Burden

The non-Form burden portion of the Steady State Burden Calculation contains three components: petitions, supplier notification, and non-reporter compliance determination. Each component and the new method's simplifying assumptions are presented below.[21]

Burden associated with supplier notification applies to suppliers with customers subject to EPCRA §313 reporting. These suppliers do not necessarily complete TRI reports/Forms themselves. On an annual basis, 3,734 facilities are assumed to spend 24 hours each for a total of 89,616 hours. This estimate is currently not regularly updated. It was reviewed in terms of providing an adequate level of burden for the task and viewed as sufficiently high. Moving forward with the same basis of numbers of facilities and hours per task—and supporting transitional baseline continuity—a constant value of **89,616 hours** is estimated.

[21] For more detailed information regarding the existing method for non-form burden estimates, see TRI 2008 ICR Supporting Statement.

Burden associated with non-reporter compliance determination comes from facilities outside of the TRI reporting community that have to determine whether they need to file a Form R or Form A. On an annual basis, 183,744 facilities[22] are assumed to spend four hours each for a total of 734,976 hours. In this method, all facilities in NAICS-code-eligible sectors (with ten or more employees) are assumed to incur compliance determination burden. When reviewing this assumption, EPA concluded that it produces a highly overstated estimate because only those facilities close to the cusp of TRI reporting thresholds for manufacture, process and otherwise use, need to check their reporting eligibility regularly. In sum, the burden estimate was reviewed in terms of providing an adequate level of burden for the task and viewed as sufficiently high. For the sake of simplicity in support of transitional baseline continuity, this basis of numbers of facilities and hours per task will be frozen and the new methodology estimates the current value as a constant—**734,976 hours**.

Burden associated with petitions for the TRI program includes activities to research, prepare and file a petition with EPA. In the existing method, five petitions per year are assumed at 185 hours per petition, totaling 925 hours. This estimate is currently not regularly updated. It was reviewed in terms of providing an adequate level of burden for the task and viewed as sufficiently high. Moving forward with the same basis of numbers of petitions and hours per petition, as well as supporting transitional baseline continuity, a constant value of **925 hours** is estimated.

In comparison to the Form burden estimates, which vary with the number and types of Forms that are being filed, the non-Form burden estimates remain constant in the Steady State Total Burden Calculation. Moreover, as these estimates are sufficiently large, and in one case highly overstated, they do not require any regular maintenance or further updates. The sum of non-Form burden is constant at **825,517 hours**.

Nominal Form R Unit Burden

Given overarching simplifications and RBBM's objective of transitional baseline continuity, Nominal Form R is back-calculated via the following equation:[23]

Eqn. B-1: *Nominal Form R Unit Burden*
= (Total Burden – non-Form burden)/[(# Form R chemicals)+((A/R)#Form A chemicals)]*

EPA defines the methodology revision's transition point as the time of the last ICR approval with conditions specified by 2008 ICR renewal projections. This calculation produces a value of 35.7 hours per Form R chemical for the *Nominal Form R unit burden*. As shown in Table B-5,

[22] The estimate for the number of facilities that are doing compliance determination but not reporting to TRI is determined by subtracting reporters from the total number of facilities with ten or more employees in TRI-subject NAICS codes. To compute the number of reporting facilities, EPA divides the current number of Form R reports from the latest ICR by the average number of Forms per facility—66,751/3.7. Although non-Form burden has historically been reported with the estimate for Form R burden in its ICR Supporting Statement, this is only done by convention, as it reflects total non-Form burden for the TRI program.

[23] In the actual calculation EPA corrects for double-counting of facility level burden among facilities filing both As and Rs in the last ICR renewal, shifting the baseline downward slightly (administrative correction due to calculation error). The double-count was caused by estimating facility-level burden twice for facilities that file both Forms R and A. In the revised methodology the conversion factors for equivalent chemicals per facility used to rescale facility unit burdens prevent double-counting.

the *Nominal Form R unit burden* is robust to changes in model assumptions as well as changes in conditions, showing differences under 1%.

In April 2010, EPA tested the effectiveness of the back-calculated *Nominal Form R unit burden* in providing transitional baseline continuity. In a spot-check comparison between RBBM Steady State Total Burden and the TRI Program on-record burden numbers, results were within 2%.[24]

Summary: Steady State Total Burden Method

Computation

Eqn. B-2: *Steady State Total Burden = Form R burden + Form A burden + non-Form burden*

= (Nominal Form R unit burden# Form R chemicals)*
+(Form R unit burden(A/R)*#Form A chemicals) + non-Form burden*

*= **35.7***# Form R chemicals + [**35.7 * .615** * # Form A chemicals] + **825,517***

Where:

A/R=	Ratio model of single-chemical Form A unit burden to Form R unit burden
Nominal Form R unit Burden=	Single base number for the entire methodology; provides the focal point for assessing and maintaining estimate accuracy.

Assumptions

The following assumptions apply for the maintenance and update recommendations that follow:

1) Simplifying substantive assumptions remain valid. First-time filers in the steady state have a negligible effect; *PBT/non-PBT burden*=1 due to lack of a verifiable alternative.
2) The *Nominal Form R unit burden* of 35.7 hours remains a reasonable estimate of unit burden with Form R non-PBT remaining the most frequent type submission.
3) Relationships between reporting activities in the Abt Associates Engineering Studies which are drawn from a subpopulation, as measured by best professional judgment of Abt Associates' engineers, are reasonably reflective of the true relationships in the total reporting population overall.
4) The distribution for Form As/Form Rs within and across facilities stays within the range of distributions in this study (see values for *Equivalent R/A Chemicals per Facility* in Appendix B Supplement).

[24] As of June 2010, the sum of burden hours "on record" was 3.87 million hours, based on Notices of OMB Action, Form R ICR and Form A ICR March 27, 2009. The corresponding RBBM estimate is 3.93 million hours which is within 2%. Note that this RBBM estimate does not include updates to the Form R unit burden to account for the slight additional burden associated with dioxin reporting (see estimate in the TRI 2012 ICR Renewal Supporting Statement).

Appendix B

Maintenance and Update Recommendations

EPA evaluated maintenance needs for *A/R, Nominal Form R unit burden,* and *Equivalent Form R/A Chemicals per Facility*. None of the models require updating on a routine basis. The *A/R* model and the back-calculated *Nominal Form R unit burden* values are robust to extreme changes in (per chemical) Form/facility distributions and model assumptions, with differences of less than 1%. However, EPA notes that the *A/R* formulation is dependent on the conversion factors used to rescale facility-level unit burdens to (per chemical) form level. Regarding the conversion factors, EPA does not anticipate extreme changes in their values under status quo operations (and even so, results here are within a 10% modeling error). However, in the event that the program adds industry sector(s), the (per chemical) form/facility distribution could shift due to the addition of large chemical counts of different distributions than the distributions considered here.

As a practical matter, given that the requirements for ICR renewal reporting provide periodic recalculation of the *Equivalent Form R/A Chemicals per Facility*, these numbers can be routinely checked to be sure that this basis for the *A/R* model (and others—FTF_f and *WAWR*) remains valid. EPA recommends this routine check.

Supplement– Distributional Analysis
Equivalent Form R Chemicals per Facility and
Equivalent Form A Chemicals per Facility

This supplement describes how and why the conversion factors, *Equivalent Form R/A Chemicals per Facility* ($Rcpf_e / Acpf_e$) were developed. The factors are used to re-scale facility-level unit burdens to (per chemical) form level unit burdens. This supplement describes:

- Why the scaling factors are needed;
- Formulas used to calculate the factors;
- Derivation of the formulas;
- Distributions for Forms R and A reporting under two scenarios; and
- Values for these factors under the two scenarios.

The derivations below provide a divisor for each facility-level unit burden that apportions facility level burden to form level burden. Based on the distributions of Form As and Form Rs within and across facilities, facility-level burden associated with Form R chemicals is apportioned equally across Form R chemicals and facility-level burden associated with Form A chemicals is apportioned equally across Form A chemicals. As a result of the derivations herein, these values, as used for scaling facility-level factors to chemical level factors are (used in matrices of Appendix A and Table A-4) are:

Equivalent Form R Chemicals per Facility, $Rcpf_e = 3.87$

Equivalent Form A Chemicals per Facility, $Acpf_e = 3.42$

Equivalent Form R Chemicals per Facility ($Rcpf_e$) and *Equivalent Form A Chemicals per Facility* ($Acpf_e$)

Facilities reporting to TRI incur facility-level burden, such as compliance determination. This facility-level burden is incurred once per reporting cycle, regardless of how many forms a facility files. Facility-level burden must be converted to a per chemical measure unit burden to be incorporated into the chemical-level ratio model. The conversion entails breaking down and apportioning the facility-level burden by chemical and it depends on the number and form-type of chemicals filed at the average facility. Since EPA tracks burden differently for A and R reporting, the apportionment must be calculated separately for Form R and Form A reporting, with consideration of the combined Form distributions at facilities.

At the form level, R and A chemicals are reported differently, with Form Rs containing one chemical per form and Form As containing one or multiple chemicals on the same form. In actual reporting, a given facility may report any combination of Form types (Rs only, As only, or Rs and As together).

For purposes of methods development and modeling, EPA refers to Form R chemicals and Form A chemicals as the number of chemicals for which each form type is submitted. This metric puts both types of reporting on the same basis, avoiding the awkward conversion to put Form As on a per chemical basis, dividing by the average number of chemicals per form. In TRI program

operations, the average number of chemicals per Form A is used to scale chemical counts to form counts, as required to report to OMB the number of responses. It is also intuitively helpful to know how many chemicals, on average, are reported via Form A. This conversion—based on raw counts of chemicals and facilities—is different than the conversion described herein for purposes of re-scaling facility-level unit burdens to per R/A chemical bases (here termed *Equivalent Form R/A Chemicals per Facility).*

Since, Form Rs and Form As are considered separately in the model, two measures of facility-level burden per chemical are needed:

Bprc	Facility-level burden per Form R chemical, in hrs/Form R chemical
Bpac	Facility-level burden per Form A chemical, in hrs/Form A chemical

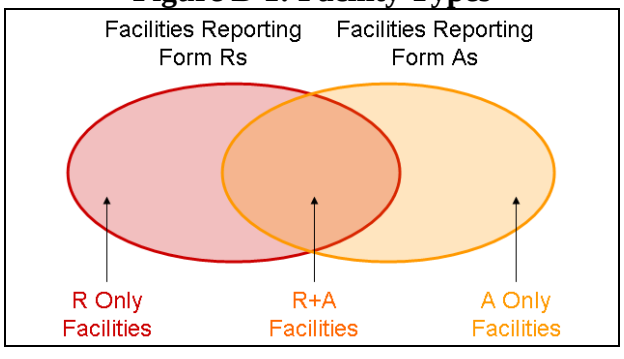
Equivalent Form R/A Chemicals per Facility are used to allocate facility-level burden to chemical-level burden. For example, chemical-level unit burden (e.g., compliance determination per Form R chemical) for Form Rs can be calculated by dividing facility-level burden associated with Form R chemicals by *Equivalent Form R Chemicals per Facility*. Similarly, chemical-level burden for Form As can be calculated by dividing facility-level burden associated with Form A chemicals by *Equivalent Form A Chemicals per Facility.*

$Rcpf_e$	*Equivalent Form R Chemicals per Facility*
$Acpf_e$	*Equivalent Form A Chemicals per Facility*

These scaling factors are used instead of average forms per facility to adjust reporting burden in a manner that prevents the potential double-counting of facility-level burden for that can occur when a facilities that files both Form Rs and Form As. There are three types of facilities that report to TRI (see Figure B-1):

- Facilities reporting only Form As (A Only),
- Facilities reporting both Form As and Form Rs (R+A), and
- Facilities reporting only Form Rs (R Only).

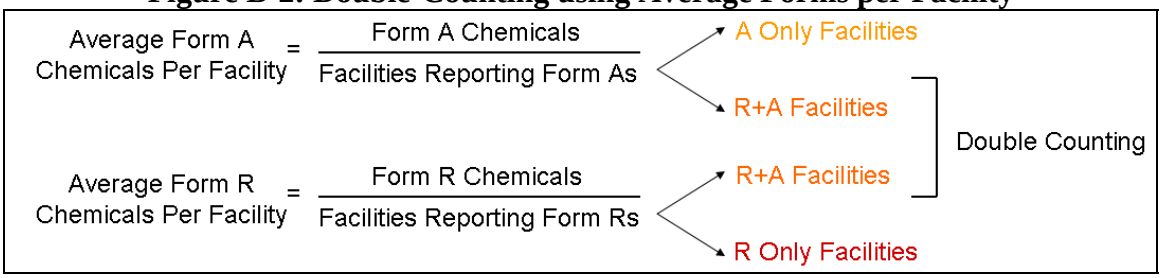
Figure B-1: Facility Types



If average forms per facility is used to allocate facility-level burden to chemical-level burden, R+A facilities are double-counted (Figure B-2). Using *Equivalent Form R/A Chemicals per*

Facility to apportion facility-level burden across forms removes this double-counting; these measures account for the distribution of Form As and Rs within and across facilities.

Figure B-2: Double-Counting using Average Forms per Facility



Calculation of *Bprc* and *Bpac* using $Rcpf_e$ and $Acpf_e$

EPA calculates *Bprc* and *Bpac* using a measure of nominal facility-level burden per facility and $Rpcf_e$ and $Apcf_e$. EPA calculates $Rpcf_e$ and $Apcf_e$ from the distributions of Form R and Form A reporting among facility types. Specific measures used include counts of Form R chemicals and Form A chemicals reported and counts of facilities reporting Form Rs and As.

The formulas *Bprc* and $Rcpf_e$ are as follows:

$Bprc = \frac{Bff_{OVERALL}}{Rcpf_e}$, where

$Rcpf_e = \frac{rc_{RTOT}}{f_{RONLY} + \eta_R f_{R+A}}$

$\eta_R = \frac{rc_{R+A}}{rc_{R+A} + ac_{R+A}}$

$Bff_{OVERALL}$ = Nominal facility-level burden per facility overall, for all TRI filers

f_{R+A} = Number of R+A facilities

f_{RONLY} = Number of R Only facilities

ac_{R+A} = Number of Form A chemicals reported to TRI by R+A facilities

rc_{R+A} = Number of Form R chemicals reported to TRI by R+A facilities

rc_{RTOT} = Number of Form R chemicals reported to TRI (by R+A and R Only facilities)

The formulas *Bpac* and $Apcf_e$ are as follows:

$Bpac = \frac{Bff_{OVERALL}}{Acpf_e}$, where

$Acpf_e = \frac{ac_{ATOT}}{f_{AONLY} + \eta_A f_{R+A}}$

$\eta_A = \frac{ac_{R+A}}{rc_{R+A} + ac_{R+A}}$

$Bff_{OVERALL}$ = Nominal facility-level burden per facility overall, for all TRI filers

f_{R+A} = Number of R+A facilities

f_{AONLY} = Number of A Only facilities

ac_{R+A} = Number of Form A chemicals reported to TRI by R+A facilities

rc_{R+A} = Number of Form R chemicals reported to TRI by R+A facilities

ac_{ATOT} = Number of Form A chemicals reported to TRI (by R+A and A Only facilities)

Derivation of Formulas for $Bprc$, $Bpac$, $Rcpf_e$, and $Acpf_e$

Together, facility-level burden per Form R chemical ($Bprc$) and facility-level burden per Form A chemical ($Bpac$) must account for facility-level burden from all three facility types (Table B-6).

Bf_{RONLY} Total facility-level burden associated with Form R chemicals from R Only facilities

Bf_{AONLY} Total facility-level burden associated with Form A chemicals from A Only facilities

Bf_{R+A} Total facility-level burden associated with Form A and R chemicals from R+A facilities

$Bf_{OVERALL}$ Total facility-level burden associated with Form R chemicals and Form A chemicals from all facilities

Table B-6: Facility-level Unit Burden

Facility Type	Form Type	Facility-Level Burden	
A Only	Form A	Bf_{AONLY}	$Bf_{OVERALL}$
A+R	Form A	Bf_{R+A}	
	Form R		
R Only	Form R	Bf_{RONLY}	

All facility-level burden from R Only facilities is apportioned to Form R chemicals. Similarly, all facility-level burden from A Only facilities is apportioned to Form A chemicals. To avoid double-counting, facility-level burden from R+A facilities is split between Form R chemicals and Form A chemicals (Table B-7).

Bf_{ATOT} Total facility-level burden associated with Form A chemicals from all facilities reporting Form As

Bf_{RTOT} Total facility-level burden associated with Form R chemicals from all facilities reporting Form Rs

Table B-7: Apportionment of Facility-level Unit Burden to Rs and As

<table>
<tr><th>Facility Type</th><th>Form Type</th><th colspan="3">Facility-Level Burden</th></tr>
<tr><td>A Only</td><td>Form A</td><td>Bf_{AONLY}</td><td rowspan="2">Bf_{ATOT}</td><td rowspan="4">$Bf_{OVERALL}$</td></tr>
<tr><td rowspan="2">A+R</td><td>Form A</td><td rowspan="2">Bf_{R+A}</td></tr>
<tr><td>Form R</td><td rowspan="2">Bf_{RTOT}</td></tr>
<tr><td>R Only</td><td>Form R</td><td>Bf_{RONLY}</td></tr>
</table>

The total facility-level burden for A+R facilities can be apportioned amongst form types using the fraction of forms reported by A+R facilities that are Form Rs and Form As (Figure B-3, Table B-8). This method assumes the magnitude of total facility-level burden for each form type is distributed evenly with the number of forms in each type reported by A+R facilities.

η_R	Fraction of the A+R facility-level burden that is associated with Form R chemicals; used to apportion total facility-level burden from A+R facilities to total facility-level burden for Form R chemicals
η_A	Fraction of the A+R facility-level burden that is associated with Form A chemicals; used to apportion total facility-level burden from A+R facilities to total facility-level burden for Form A chemicals
rc_{R+A}	Number of Form R chemicals reported by A+R facilities
ac_{R+A}	Number of Form A chemicals reported by A+R facilities

Eqn. 1 $\eta_R = \frac{rc_{R+A}}{rc_{R+A}+ac_{R+A}}$

Eqn. 2 $\eta_A = \frac{ac_{R+A}}{rc_{R+A}+ac_{R+A}}$

Note that $\eta_A + \eta_R = 1$. Combining Eqn. 1 and Eqn. 2:

Eqn. 3 $\eta_A + \eta_R = \frac{rc_{R+A}}{rc_{R+A}+ac_{R+A}} + \frac{ac_{R+A}}{rc_{R+A}+ac_{R+A}} = \frac{rc_{R+A}+ac_{R+A}}{rc_{R+A}+ac_{R+A}} = 1$

Figure B-3: Fraction of Forms Reported By R+A Facilities that are Form Rs And Form As

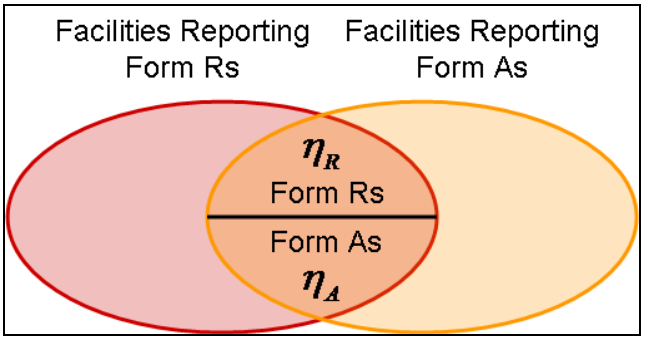


Table B-8: Apportionment of Facility-level Unit Burden from R+A Facilities

<table>
<tr><th>Facility Type</th><th>Form Type</th><th colspan="3">Facility-Level Burden</th></tr>
<tr><td>A Only</td><td>Form A</td><td colspan="2">Bf_{AONLY}</td><td rowspan="2">Bf_{ATOT}</td><td rowspan="3">$Bf_{OVERALL}$</td></tr>
<tr><td rowspan="2">A+R</td><td>Form A</td><td rowspan="2">Bf_{R+A}</td><td>$\eta_A \cdot Bf_{R+A}$</td></tr>
<tr><td>Form R</td><td>$\eta_R \cdot Bf_{R+A}$</td><td rowspan="2">Bf_{RTOT}</td></tr>
<tr><td>R Only</td><td>Form R</td><td colspan="2">Bf_{RONLY}</td></tr>
</table>

Apportioning all facility-level burden from R Only facilities to Form R chemicals, all facility-level burden from A Only facilities to Form A chemicals, and splitting facility-level burden from R+A facilities between Form R chemicals and Form A chemicals involves the following:

Eqn. 4 $Bf_{RTOT} = \eta_R \cdot Bf_{R+A} + Bf_{RONLY}$

Eqn. 5 $Bf_{ATOT} = \eta_A \cdot Bf_{R+A} + Bf_{AONLY}$

The total facility-level burden for all TRI filers can be apportioned amongst facility types using the fraction of TRI reporters in each facility type (Figure B-4). This method assumes the fraction of total facility-level burden incurred by each facility type is equal to the fraction of facilities in each type.

$f_{OVERALL}$	Number of facilities reporting to TRI
f_{RONLY}	Number of R Only facilities
f_{AONLY}	Number of A Only facilities
f_{R+A}	Number of R+A facilities
x_{RONLY}	Fraction of TRI reporters (facilities) reporting only Form Rs,
x_{AONLY}	Fraction of TRI reporters (facilities) reporting only Form As
x_{R+A}	Fraction of TRI reporters (facilities) reporting Form Rs and As

Eqn. 6 $x_{RONLY} = \frac{f_{RONLY}}{f_{OVERALL}} = \frac{Bf_{RONLY}}{Bf_{OVERALL}}$

Eqn. 7 $x_{AONLY} = \frac{f_{AONLY}}{f_{OVERALL}} = \frac{Bf_{AONLY}}{Bf_{OVERALL}}$

Eqn. 8 $x_{R+A} = \frac{f_{R+A}}{f_{OVERALL}} = \frac{Bf_{R+A}}{Bf_{OVERALL}}$

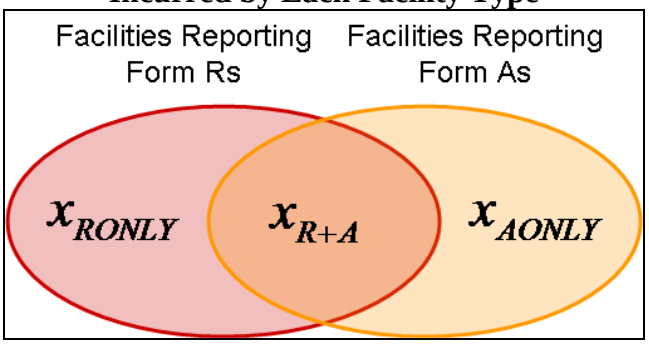
Combining Eqn. 4, Eqn. 6, and Eqn. 8:

Eqn. 9 $Bf_{RTOT} = x_{RONLY} Bf_{OVERALL} + \eta_R x_{R+A} Bf_{OVERALL}$

Combining Eqn. 5, Eqn. 7, and Eqn. 8:

Eqn. 10 $Bf_{ATOT} = x_{AONLY} Bf_{OVERALL} + \eta_A x_{R+A} Bf_{OVERALL}$

Figure B-4: The Fraction of Total Facility-Level Burden Incurred by Each Facility Type



The total facility-level burden for all TRI filers divided by the total number of TRI filers equals the facility-level burden per facility for all TRI filers.

$Bff_{OVERALL}$ Facility-level burden per facility overall, for all TRI filers

Eqn. 11 $$\frac{Bf_{OVERALL}}{f_{OVERALL}} = Bff_{OVERALL}$$

Combining Eqn. 9 and Eqn. 11:

Eqn. 12 $$Bf_{RTOT} = x_{RONLY} Bff_{OVERALL} \cdot f_{OVERALL} + \eta_R x_{R+A} Bff_{OVERALL} \cdot f_{OVERALL}$$

Combining Eqn. 10 and Eqn. 11:

Eqn. 13 $$Bf_{ATOT} = x_{AONLY} Bff_{OVERALL} \cdot f_{OVERALL} + \eta_A x_{R+A} Bff_{OVERALL} \cdot f_{OVERALL}$$

Total facility-level burden can be converted to facility-level burden per chemical by dividing by number of chemicals:

Eqn. 14 $$Bprc = \frac{Bf_{RTOT}}{rc_{RTOT}}$$

Eqn. 15 $$Bpac = \frac{Bf_{ATOT}}{ac_{ATOT}}$$

Combining Eqn. 12 and Eqn. 14:

Eqn. 16 $$Bprc = \frac{x_{RONLY} Bff_{OVERALL} \cdot f_{OVERALL} + \eta_R x_{R+A} Bff_{OVERALL} \cdot f_{OVERALL}}{rc_{RTOT}}$$

Simplifying Eqn. 16:

Eqn. 17 $$Bprc = \frac{f_{RONLY} + \eta_R f_{R+A}}{rc_{RTOT}} \cdot Bff_{OVERALL}$$

In Eqn. 17, $f_{RONLY} + \eta_R f_{R+A}$ represents the equivalent number of facilities associated with Form R reporting. *Equivalent Form R Chemicals per Facility* equals the number of Form R chemicals reported divided by this number of facilities.

Eqn. 18 $$Rcpf_e = \frac{rc_{RTOT}}{f_{RONLY} + \eta_R f_{R+A}}$$

Combining Eqn. 17 and Eqn. 18:

Eqn. 19 $$Bprc = \frac{Bff_{OVERALL}}{Rcpf_e}$$

Combining Eqn. 13 and Eqn. 15:

Eqn. 20 $$Bpac = \frac{x_{AONLY} Bff_{OVERALL} \cdot f_{OVERALL} + \eta_A x_{R+A} Bff_{OVERALL} \cdot f_{OVERALL}}{ac_{ATOT}}$$

Simplifying Eqn. 20:

Eqn. 21 $$Bpac = \frac{f_{AONLY} + \eta_A f_{R+A}}{ac_{ATOT}} Bff_{OVERALL}$$

In Eqn. 21, $f_{AONLY} + \eta_A f_{R+A}$ represents the equivalent number of facilities associated with Form A reporting. *Equivalent Form A Chemicals per Facility* equals the number of Form A chemicals reported divided by this number of facilities.

Eqn. 22 $$Acpf_e = \frac{ac_{ATOT}}{f_{AONLY} + \eta_A f_{R+A}}$$

Combining Eqn. 23 and Eqn. 24:

Eqn. 23 $$Bpac = \frac{Bff_{OVERALL}}{Acpf_e}$$

Calculation of $Bprc$, $Bpac$, $Rcpf_e$, and $Acpf_e$ Under Current Operations

$Bprc$ and $Bpac$ can be calculated using the distribution of forms and facilities among facility types under current operations as projected in the 2008 ICR renewal. This distribution is presented in Table B-9.

Table B-9: Form and Facility Distributions Under Current Operations - No Burden Reduction

Reporter Type	Unique Facilities	Count of Chemicals			Average Number of Chemicals		
		R	A	Total	R	A	Total
A Only	2,307	0	4,831	4,831	N/A	2.09	2.09
R Only	18,748	67,772	0	67,772	3.61	N/A	3.61
Both R and A	2,406	10,764	5,945	16,709	4.47	2.47	6.94
Total/Overall	23,461	78,536	10,776	89,312	3.73	2.30	3.81

Note: Raw form counts were used to match the 2008 ICR. Chemicals are not rolled up at the facility-chemical level.
Source: TRI 2005 Public Data Release, RY 2005

Under current TRI operations,

- Nominal Facility-level burden=1.25 for non-PBT, subsequent year (compliance determination only)
- *Equivalent Form R Chemicals per Facility* = 3.87
- *Equivalent Form A Chemicals per Facility* = 3.41
- Facility-level burden per Form R chemical = 0.32
- Facility-level burden per Form A chemical = 0.37 (Table B-10 and Table B-11)

Table B-10: Variables, Formulas, and Values Used to Calculate Facility-level Burden per Form R Chemical Under Current Operations

Variable/Formula	Value
rc_{RTOT}	78,536
rc_{R+A}	10,764
ac_{R+A}	5,945
f_{RONLY}	18,748
f_{R+A}	2,406
$Bff_{OVERALL}$	1.25
$\eta_R = \frac{rc_{R+A}}{rc_{R+A}+ac_{R+A}}$	0.64
$Rcpf_e = \frac{rc_{RTOT}}{f_{RONLY}+\eta_R f_{R+A}}$	3.87
$Bprc = \frac{Bff_{OVERALL}}{Rcpf_e}$	0.32

Table B-11: Variables, Formulas, and Values Used to Calculate Facility-level Burden per Form A Chemical Under Current Operations

Variable/Formula	Value
ac_{ATOT}	10,776
rc_{R+A}	10,764
ac_{R+A}	5,945
f_{AONLY}	2,307
f_{R+A}	2,406
$Bff_{OVERALL}$	1.25
$\eta_A = \frac{ac_{R+A}}{rc_{R+A}+ac_{R+A}}$	0.36
$Acpf_e = \frac{ac_{ATOT}}{f_{AONLY}+\eta_A f_{R+A}}$	3.41
$Bpac = \frac{Bff_{OVERALL}}{Acpf_e}$	0.37

Appendix B

Calculation of *Bprc*, *Bpac*, $Rpcf_e$, and $Apcf_e$ Under Alternate Operations

Bprc and *Bpac* were also calculated under an alternative scenario, using the distribution of Form R/ Form A within and across facilities during phase II burden reduction conditions. This alternative distribution is presented in Table B-12.

Table B-12: Form and Facility Distributions Under Alternate Conditions

Reporter Type	Unique Facilities	Count of Chemicals			Average Number of Chemicals		
		R	A	Total	R	A	Total
A Only	4,020	0	8,096	8,096	N/A	2.01	2.01
R Only	13,226	35,196	0	35,196	2.66	N/A	2.66
Both R and A	6,215	31,555	14,465	46,020	5.08	2.33	7.40
Total/Overall	23,461	66,751	22,561	89,312	3.80	2.21	3.81

Note: Raw form counts were used to match the 2008 ICR. Chemicals were not rolled up at the facility-chemical level.
Source: TRI 2005 Public Data Release, RY 2005

Under alternate conditions,

- Nominal Facility-level burden=1.25 for non-PBT, subsequent year (compliance determination only)
- *Equivalent Form R Chemicals per Facility* = 3.82
- *Equivalent Form A Chemicals per Facility* = 3.78
- Facility-level burden per Form R chemical = 0.33
- Facility-level burden per Form A chemical = 0.33 (Table B-13 and Table B-14)

Table B-13: Variables, Formulas, and Values Used to Calculate Facility-level Burden per Form R Chemical Under Alternate Conditions

Variable/Formula	Value
rc_{RTOT}	66,751
rc_{R+A}	31,555
ac_{R+A}	14,465
f_{RONLY}	13,226
f_{R+A}	6,215
$Bff_{OVERALL}$	1.25
$\eta_R = \frac{rc_{R+A}}{rc_{R+A}+ac_{R+A}}$	0.69
$Rcpf_e = \frac{rc_{RTOT}}{f_{RONLY}+\eta_R f_{R+A}}$	3.82
$Bprc = \frac{Bff_{OVERALL}}{Rcpf_e}$	0.33

Table B-14: Variables, Formulas, and Values Used to Calculate Facility-level Burden per Form A Chemical Under Alternate Conditions

Variable/Formula	Value
ac_{ATOT}	22,561
rc_{R+A}	31,555
ac_{R+A}	14,465
f_{AONLY}	4,020
f_{R+A}	6,215
$Bff_{OVERALL}$	1.25
$\eta_A = \frac{ac_{R+A}}{rc_{R+A}+ac_{R+A}}$	0.31
$Acpf_e = \frac{ac_{ATOT}}{f_{AONLY}+\eta_A f_{R+A}}$	3.78
$Bpac = \frac{Bff_{OVERALL}}{Acpf_e}$	0.33

Appendix C

Form Element Estimation

This appendix presents the Form Element Estimation method of the Ratio-Based Burden Methodology (RBBM), including the models of Standardized Form Element Burdens. The method provides a standardized set of form element burdens for use when estimating changes to the Form R, as applied to the *Nominal Form R unit burden*.[1]

This method is different from the other methods of RBBM in the way it implements the methodology priorities of simplicity, internal consistency, and estimate baseline continuity. Unlike the *A/R*, *FTF* and *WAWR*, this method's models are closely tied to the methodology's base number, *Nominal Form R unit burden*. If estimates obtained by this method are not considered in context of the unit burden used for reference, they may induce artificial baseline shifts, or at a minimum, produce internal inconsistencies, as burden estimates due to form changes do not adequately reflect their proportionate contribution to the total form unit burden. The means by which this method maintains internal consistency with *Nominal Form R unit burden* is by ensuring that the form elements of the Form R sum to the value (or close to the value of) the *Nominal Form R unit burden.* Therefore, in the event that the *Nominal Form R unit burden* undergoes a wholesale update or large change its value, the entire Form Element Estimation method must be revised so that Standardized Form Element Burdens proportionately add up to the value of the new *Nominal Form R unit burden*.

For simplicity, this method standardizes the Abt Associates Engineering Studies estimates to develop Standardized Form Element Burdens. Standardization is achieved by organizing similar form elements into standard categories, and then using average burdens. For internal consistency between Standardized Form Element Burdens and the *Nominal Form R unit burden*, the elements are scaled so that the sum of all element estimates is equal to the *Nominal Form R unit burden* of 35.7. Like the *Nominal Form R unit burden*, each form element estimate is fully loaded, incorporating facility-level burden. This approach is consistent with Decision Rule #5 on page 10 in the main report.[2] With respect to transitional and ongoing baseline continuity, the method ensures that the changes in unit burden are estimated in a manner that induces changes to the baseline commensurate with intended changes in the form.

Form Element Estimation Method

Method Development

The method provides a way to quickly estimate an incremental burden associated with a form change. The equation below represents the method for estimating the total burden after accounting for the new data elements.

$$\textit{Nominal Form R unit burden}_{new} = \textit{Nominal Form R unit burden}_{old} + \textit{Form change burden}$$

[1] Changes that affect Form R may or may not affect Form A. In this methodology, when changes to Form R affect Form A, they are theoretically captured when the Form R unit burden is multiplied by the *A/R* model. The *A/R* model is not updated in conjunction with form changes, as it is sufficiently robust.

[2] This scaling differs from scaling used in Abt Associates Engineering Studies (see references in Appendix G). In the Engineering Studies, when scaling from "realistic" to "scaled" estimates, elements were not scaled up proportionately. Some elements were considered "un-scalable." This decision altered the relative proportions of each element, compromising internal consistency and considered inappropriate for RBBM.

The form change burden could be a positive or negative number, depending on the nature of the form elements that are added to, or removed from, Form R. In order to implement this feature, EPA first developed a classification system of estimates related to the current form and then scaled the standardized elements so they sum to the *Nominal Form R unit burden.* Key analytical decisions included 1) defining the categories of the classification system that best represent the form elements, and 2) specifying the scaling system that works best for this method's objectives as well as overall methodology objectives. The development steps are described below. Due to the very long nature of the tables, they are all presented at the end of this Appendix with the exception of Table C-5, which is brief and therefore included in the body of the Appendix.

Identifying Standardized Categories

As mentioned above, EPA developed a classification system of estimates related to the existing Form R and then grouped data elements into standardized burden categories. This section describes how the classification system was organized. Table C-1 provides the list of estimates from the TRI RY 2002 Form R from the Abt Associates Engineering Studies (see Appendix G).[3] From this list, EPA defined categories and computed means and variance for each category.

This method groups elements into corresponding categories to which new data elements may belong. Data elements were grouped into categories using the following criteria:

1. The information collected by the data element: release value, facility location information, chemical identification information; and
2. The type of work required to fill out the data element: locating and reviewing monitoring data, conducting a short information look-up, or typing a simple code.

Initially, data elements were grouped into categories with other elements that required the collection of similar information. However, in some cases these initial categories had high variability in estimated engineering burden. EPA reduced this variability by refining the categories by type of work required. Data elements collecting estimates of source reduction and recycling activity in the current year, for example, were initially grouped together yet varied considerably in burden. This group was then split into two groups: one for quantities derived from relevant Section 5 and 6 data elements and the other for source reduction and recycling estimates with no relevant Section 5 and 6 data elements. The final list of data elements in their respective categories is included in Table C-2.

The estimates are called raw estimates for the purpose of this study, as they did not contain incidence weights, which were based on response frequencies by data element. EPA discussed the merits and disadvantages of using the Abt Associates Engineering Studies fully engineered numbers, as were used in *A/R, FTF* and *WAWR*. However, for the needs of this method, they were not considered the most appropriate estimates. Given the setting in which EPA estimates form changes, often the incidence rate for a new element is unknown, providing no basis for an average or general assumption. Also, given the objective of Standardized Form Element Burdens, raw data element estimates provided consistent information for data elements that are

[3] Although the information drew from a non-representative sample of reporters, the study's design insured a high level of internal consistency due to its internal validity. See Appendix B for a complete discussion of the strengths and weaknesses of Abt Associates Engineering Studies as they apply to RBBM.

theoretically the same without respect to reporter behavior. Similarly, knowing in advance that the method will require scaled estimates used to update the *Nominal Form R unit burden*, then it is desirable to have similar data elements possess the same standardized value. As a result of these considerations, EPA decided to use the raw estimates without incidence weighting for the pre-scaling basis of the method. This decision provides internal consistency from data elements to Form and across Form R and Form A.

Scaling Options

EPA considered whether or not it was necessary to scale the standardized categories to the *Nominal Form R unit burden* to ensure consistency between the Form Element Estimation Method and the *Nominal Form R unit burden*. The following four options were considered:

- Option 1 – No scaling, use raw estimates (no incidence weighting)
- Option 2 – No scaling, use incidence weighted raw estimates
- Option 3 – Scale raw estimates (no incidence weighting) to Nominal Form R burden (35.7 hours).
- Option 4[4] – Scale raw estimates (no incidence weighting) to Calculation and Form Completion portion of Nominal Form R burden (20.4 hours)

EPA then ranked the first three options based on internal consistency, parsimony, intuitive calculations, temporal consistency, ICR renewal implications and EA implications (see Table C-4). With the highest rank, Option 3 was selected as the best approach. The main reasons for this decision are as follows:

1. Scaling the raw estimate category so that the Form R totals 35.7 hours provides consistency because 35.7 hours is the value of the *Nominal Form R unit burden*. As with the *Nominal Form R unit burden*, the Standardized Form Element Burdens reflect "fully loaded" estimates of all activities associated with Form R completion (facility-level and per chemical form-level).
2. At face value, this scaling produces relatively intuitive calculations given expectations that that the sum of category means should equal the total burden per Form R.

Tables C-2 and C-3 present a general profile for each category of the Standardized Form Element Burdens, including the number of data elements corresponding to each category, the mean, and the standard deviation for each category with burden estimates raw and scaled to 35.7 hours, respectively.

Findings

The Form Element Estimation method is designed to provide a structured and reproducible method for estimating burden associated with Form changes. When new form elements are added to Form R, EPA staff will be able to use Table C-3 or Figure A-2 standardized burdens to determine what change in burden (in hours) is associated with the form changes.

Additionally, with experience, EPA has discovered that form changes do not always manifest themselves within the confines of this method's framework for "add or subtract a form element."

[4] Note that Option 4 was considered at a later date and therefore, was not ranked.

In fact, changes are often so minuscule that EPA estimates them to have a negligible impact on form-related burden. Table C-5 provides a list of changes of this nature.

Table C-5: Form Changes for Which Additional Burden is not Estimated

Form Change	Circumstance of Inestimable Burden
Code or Check Box (could include: indication of activity or reason, yes/no, NA, etc.)	Where burden associated with data gathering and recording is negligible and frequency of reporting the data element is low. Or if response is already implied in existing data element (e.g. addition of NA box)
Clarification of existing required data fields including reorganization	Where clarification on reporting form is made but no new information is required
Addition of optional open-ended question	No burden by convention

Method Summary

Computation

To illustrate how a revised *Nominal Form R unit burden* is calculated when new data elements are added to Form R, assume that EPA is adding a new data element to capture an additional EPA identification number such as the Facility Registry System (FRS) ID. If the analyst is familiar with the specific existing data element or group of existing data elements to which the new data element is similar, he/she can refer to the relevant categorical burden in the Standardized Form Element Burdens listed in Table C-3 and in the Program Staff Tool. Alternately, the analyst can look up a similar element's standardized burden, as depicted in Figure A-2. Table C-3 shows the time estimate for Facility Identification Information Codes .0023 hours. The sample calculation of the new *Nominal Form R unit burden* is as follows:

Eqn. C-1: Form R Unit Burden when New Form Elements are Added

$$\textit{Nominal Form R unit burden}_{new} = \textit{Nominal Form R unit burden}_{old} + \textit{Form change burden}$$

$$\textit{Nominal Form R unit burden}_{new} = 35.7 \textit{ hours} + .0023 \textit{ hours} = 35.7023 \textit{ hours}$$

Assumptions

When a new form element is added to Form R and the incremental burden associated with the form element is selected from one of the categories, the following three assumptions are made:

1) The corresponding category is representative of the new data element. For this assumption to hold true, reporter activity representing the new data element should be similar to the activities comprising that general category.
2) The incidence weight for the new data element need not be considered in this method.
3) The *Nominal Form R unit burden*—as the calculated sum of form element burdens—remains close to the value used to scale the system of form elements (35.7 hours) because burden associated with form changes are small relative to the overall form burden.

Appendix C

Maintenance and Update Recommendations

This method does not require periodic updates. The decision on whether an update is necessary should be made according to the following recommendation:

- For ICR renewals and EAs accompanying major rulemakings: review the form element categories to ensure proper form element classification. Compare the scaling basis of 35.7 to the current value assigned to *Nominal Form R unit burden.*
- For minor EAs and other minor analyses: no update is required.

In the event that the *Nominal Form R unit burden* undergoes a wholesale update or large change in its value, the entire Form Element Estimation method must be revised to assure that Standardized Form Element Burdens proportionately add up to the value of the new *Nominal Form R unit burden.*

Table C-1: List of Categories and Corresponding Form Elements

Category	Form Part	Sub Section	Data Element
Certification	PART I. Facility Identification Information	3: Certification	Name and official title
			Signature
			Date signed
Chemical Identification Information	PART II. Toxic Chemical Release Inventory Reporting Form	1.1: CAS Number	Section 1.1: CAS number
		1.2: Toxic Chemical or Chemical Category Name	Section 1.2: Toxic chemical or chemical category name
		1.3: Generic Chemical Name	Section 1.3: Generic chemical name
		2.1: Generic Chemical Name Provided by Supplier	Section 2.1: Generic chemical name provided by supplier
Code or Checkbox for Readily Available Info	PART II. Toxic Chemical Release Inventory Reporting Form	5.1: Fugitive or non-point air emissions	B. Basis of estimate
		5.2: Stack or point air emissions	B. Basis of estimate
		5.4.1: Underground injection onsite to Class I wells	B. Basis of estimate
		5.4.2: Underground injection onsite to Class II-V wells	B. Basis of estimate
		5.5.1A: RCRA Subtitle C landfills	B. Basis of estimate
		5.5.1B: Other landfills	B. Basis of estimate
		5.5.2: Land treatment/application farming	B. Basis of estimate
		5.5.3A: RCRA Subtitle C surface impoundments	B. Basis of estimate

		5.5.3B: Other surface impoundments	B. Basis of estimate
		5.5.4: Other disposal	B. Basis of estimate
		6.1.A: Total quantity transferred to POTWs and basis of estimate	6.1.A.2: Basis of estimate
		7A.1e: Based on operating data?	7A.1e: Based on operating data?
		5.3: Discharges to receiving streams or water bodies	B. Basis of estimate
		6.2: Transfers to other off-site locations	B: Basis of estimate
		6.2: Transfers to other off-site locations	C: Type of waste treatment/ disposal/recycling/energy recovery
		8.10: Did your facility engage in any source reduction activities?	Methods to identify activity
Description of M/P/OU at Facility	PART II. Toxic Chemical Release Inventory Reporting Form	3.1: Manufacture the toxic chemical	Section 3.1: Manufacture the toxic chemical
		3.2: Process the toxic chemical	Section 3.2: Process the toxic chemical
		3.3: Otherwise use the toxic chemical	Section 3.3: Otherwise use the toxic chemical
Description of Treatment or Pollution Prevention Activity	PART II. Toxic Chemical Release Inventory Reporting Form	7B: On-site energy recovery processes	Energy recovery methods
		7C: On-site recycling processes	Recycling Methods
		7A: On-site waste treatment methods and efficiency	7A.1b: Waste treatment method(s) sequence
		8.10: Did your facility engage in any source reduction activities?	Source reduction activities
Description of Waste Stream at Facility	PART II. Toxic Chemical Release Inventory Reporting Form	7A: On-site waste treatment methods and efficiency	7A.1a: General waste stream (enter code)
Facility Identification Information - Codes	PART 1. Facility Identification Information	4.5	Section 4.5 NAICS Code(s) (6 digits)
		4.6	Section 4.6: Dunn and Bradstreet Number(s) (9 digits)
		5.2: Parent company's Dun & Bradstreet number	Section 5.2: Parent company's Dun & Bradstreet number
		4.8: EPA identification number (RCRA I.D. No.)	Section 4.8: EPA identification number (RCRA I.D. No.)
		4.9: Facility NPDES permit number(s)	Section 4.9: Facility NPDES permit number(s)
		4.10: Underground injection well code (UIC) I.D. number(s)	Section 4.10: Underground injection well code (UIC) I.D. number(s)
		4.1	TRI facility ID number

Facility Identification Information - Geographic	PART 1. Facility Identification Information	4.6: Latitude	Degrees
			Minutes
			Seconds
			Degrees
			Minutes
			Seconds
Facility Identification Information - Name and Contact	PART 1. Facility Identification Information	4.1	Facility or establishment name
			Street
			City/county/state/zip code
			Facility or establishment name or mailing address (if different from street address)
			Mailing address
			City/state/zip code
			Country (non-US)
		4.3	Technical contact name
			Telephone number
			Email address
		4.4	Public contact name
			Telephone number
		5.1: Name of parent company	Section 5.1: Name of parent company
Form Type	PART 1. Facility Identification Information	1: Reporting Year	Section 1: Reporting Year
		2.1: Are you claiming the toxic chemical identified on page 2 trade secret?	Section 2.1: Are you claiming the toxic chemical identified on page 2 trade secret?
		2.2: Is this copy sanitized or unsanitized?	Section 2.2: Is this copy sanitized or unsanitized?
		4.2: This report contains information for (check a or b; check c or d if applicable)	Section 4.2: This report contains information for (check a or b; check c or d if applicable)

Future Year Projection	PART II. Toxic Chemical Release Inventory Reporting Form	8.1a: Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	Column C: Following year
			Column D: Second following year
		8.1b: Total other on-site disposal or other releases	Column C: Following year
			Column D: Second following year
		8.1c: Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	Column C: Following year
			Column D: Second following year
		8.1d: Total other off-site disposal or other releases	Column C: Following year
			Column D: Second following year
		8.2: Quantity used for energy recovery on-site	Column C: Following year
			Column D: Second following year
		8.3: Quantity used for energy recovery off-site	Column C: Following year
			Column D: Second following year
		8.4: Quantity recycled on-site	Column C: Following year
			Column D: Second following year
		8.5 Quantity recycled offsite	Column C: Following year
			Column D: Second following year
		8.7: Quantity treated off-site	Column C: Following year
			Column D: Second following year
		8.6: Quantity treated on-site	Column C: Following year
			Column D: Second following year
Measure of Activity at Facility	PART II. Toxic Chemical Release Inventory Reporting Form	8.9: Production ratio or activity index	Section 8.9: Production ratio or activity index
		4.1	Section 4.1: Determine maximum quantity on-site

Measure of Waste/Discharge Stream	PART II. Toxic Chemical Release Inventory Reporting Form	7A.1c: Range of influent concentration	7A.1c: Range of influent concentration
		5.3: Discharges to receiving streams or water bodies	C. % from stormwater
		7A: On-site waste treatment methods and efficiency	7A.1d: Waste treatment efficiency estimate
NA	PART II. Toxic Chemical Release Inventory Reporting Form	5.1: Fugitive or non-point air emissions	NA
		5.2: Stack or point air emissions	NA
		5.4.1: Underground injection onsite to Class I wells	NA
		5.4.2: Underground injection onsite to Class II-V wells	NA
		5.5.1A: RCRA Subtitle C landfills	NA
		5.5.1B: Other landfills	NA
		5.5.2: Land treatment/application farming	NA
		5.5.3A: RCRA Subtitle C surface impoundments	NA
		5.5.3B: Other surface impoundments	NA
		5.5.4: Other disposal	NA
		7A: On-site waste treatment methods and efficiency	NA
		7B: On-site energy recovery processes	NA
		7C: On-site recycling processes	NA
		5.3: Discharges to receiving streams or water bodies	NA
Optional Data Element	PART II. Toxic Chemical Release Inventory Reporting Form	8.11: If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, check "Yes."	Section 8.11: If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, check "Yes."
Quantity Derived from Relevant Section 5 and 6 Data Elements	PART II. Toxic Chemical Release Inventory Reporting Form	8.1a: Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	Column B: Current reporting year
		8.1b: Total other on-site disposal or other releases	Column B: Current reporting year
		8.1c: Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	Column B: Current reporting year
		8.1d: Total other off-site disposal or other releases	Column B: Current reporting year

		8.3: Quantity used for energy recovery off-site	Column B: Current reporting year
		8.5 Quantity recycled offsite	Column B: Current reporting year
		8.7: Quantity treated off-site	Column B: Current reporting year
		8.8: Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes	Section 8.8: Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes
Receiving Facility/Site Identification Information	PART II. Toxic Chemical Release Inventory Reporting Form	5.3: Discharges to receiving streams or water bodies	5.3.1: Stream or water body name
		6.1.B: POTW	POTW name
			POTW address
			City
			State
			County
			Zip
		6.2: Transfers to other off-site locations	Off-site EPA identification number (RCRA ID No.)
			Off-site location name
			Off-site address
			City
			State
			County
			Zip
			Country (non-US)
			Is location under control of reporting facility or parent company?
Release Quantity Estimated Using Emissions Factors	PART II. Toxic Chemical Release Inventory Reporting Form	5.2: Stack or point air emissions	A. Total release
Release Quantity	PART II. Toxic Chemical Release Inventory Reporting	5.5.1A: RCRA Subtitle C landfills	A. Total release

Estimated Using Facility Records	Form	5.5.1B: Other landfills	A. Total release
		5.5.3A: RCRA Subtitle C surface impoundments	A. Total release
		5.5.3B: Other surface impoundments	A. Total release
		5.5.4: Other disposal	A. Total release
		6.2: Transfers to other off-site locations	A: Total transfers
		5.4.1: Underground injection onsite to Class I wells	A. Total release
		5.4.2: Underground injection onsite to Class II-V wells	A. Total release
		5.5.2: Land treatment/application farming	A. Total release
		6.1.A: Total quantity transferred to POTWs and basis of estimate	6.1.A.1: Total transfers
		5.3: Discharges to receiving streams or water bodies	A. Total release
Release Quantity Estimated Using Physical and Chemical Properties of Chemical and Process Operating Conditions	PART II. Toxic Chemical Release Inventory Reporting Form	5.1: Fugitive or non-point air emissions	A. Total release
SRR with No Relevant Section 5 and 6 Data Elements Current Year	PART II. Toxic Chemical Release Inventory Reporting Form	8.2: Quantity used for energy recovery on-site	Column B: Current reporting year
		8.4: Quantity recycled on-site	Column B: Current reporting year
		8.6: Quantity treated on-site	Column B: Current reporting year
Value Reported in Prior Year	PART II. Toxic Chemical Release Inventory Reporting Form	8.1a: Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	Column A: Prior year
		8.1b: Total other on-site disposal or other releases	Column A: Prior year
		8.1c: Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	Column A: Prior year
		8.1d: Total other off-site disposal or other releases	Column A: Prior year

		8.2: Quantity used for energy recovery on-site	Column A: Prior year
		8.3: Quantity used for energy recovery off-site	Column A: Prior year
		8.4: Quantity recycled on-site	Column A: Prior year
		8.5 Quantity recycled offsite	Column A: Prior year
		8.6: Quantity treated on-site	Column A: Prior year
		8.7: Quantity treated off-site	Column A: Prior year

Table C-2: Standardized Form Element Burden Categories (Raw Estimate Means and Standard Deviations)

Category	Number of Data Elements	Time (Hours)	
		Mean	St Dev
Certification	3	NA	NA
Chemical Identification Information	4	0.0014	0.0000
Code or Checkbox for Readily Available Info	15	0.0057	0.0005
Description of M/P/OU at Facility	3	0.0014	0.0000
Description of Treatment or Pollution Prevention Activity	4	0.3889	0.2102
Description of Waste Stream at Facility	1	0.0972	NV
Facility Identification Information - Codes	4	0.0014	0.0000
Facility Identification Information - Name and Contact	14	0.0014	0.0000
Form Type	4	0.0035	0.0014
Future Year Projection	20	0.0181	0.0000
Measure of Activity at Facility	2	0.5667	0.0668
Measure of Waste/Discharge Stream	2	0.2494	0.2997
NA	13	0.0028	0.0000
Optional Data Element	1	0.0000	NV
Quantity Derived from Relevant Section 5 and 6 Data Elements	8	0.0875	0.0000
Receiving Facility/Site Identification Information	16	0.0046	0.0027
Release Quantity Estimated Using Emissions Factors	1	1.1278	NV
Release Quantity Estimated Using Facility Records	6	1.0861	0.2645
Release Quantity Estimated Using Monitored Values	5	1.1287	0.1644
Release Quantity Estimated Using Physical and Chemical Properties of Chemical and Process Operating Conditions	1	1.9583	NV
SRR with No Relevant Section 5 and 6 Data Elements Current Year	3	0.5139	0.0000
Value Reported in Prior Year	10	0.0056	0.0000

NV indicates a value could not be calculated because there is only one data element in the category or because total raw time is zero.

Appendix C

Table C-3: Standardized Form Element Burden Categories (Means and Standard Deviations Based on Raw Burden Estimates Scaled to 35.7 Hours)

Category	Number of Data Elements	Time (Hours)	
		Mean	St Dev
Certification	3	NA	NA
Chemical Identification Information	4	0.0023	0.0000
Code or Checkbox for Readily Available Info	15	0.0096	0.0008
Description of M/P/OU at Facility	3	0.0023	0.0000
Description of Treatment or Pollution Prevention Activity	4	0.6481	0.3502
Description of Waste Stream at Facility	1	0.1620	NV
Facility Identification Information - Codes	4	0.0023	0.0000
Facility Identification Information - Name and Contact	14	0.0023	0.0000
Form Type	4	0.0058	0.0023
Future Year Projection	20	0.0301	0.0000
Measure of Activity at Facility	2	0.9444	0.1113
Measure of Waste/Discharge Stream	2	0.4157	0.4995
NA	13	0.0046	0.0000
Optional Data Element	1	0.0000	NV
Quantity Derived from Relevant Section 5 and 6 Data Elements	8	0.1458	0.0000
Receiving Facility/Site Identification Information	16	0.0077	0.0044
Release Quantity Estimated Using Emissions Factors	1	1.8795	NV
Release Quantity Estimated Using Facility Records	6	1.8100	0.4408
Release Quantity Estimated Using Monitored Values	5	1.8810	0.2740
Release Quantity Estimated Using Physical and Chemical Properties of Chemical and Process Operating Conditions	1	3.2636	NV
SRR with No Relevant Section 5 and 6 Data Elements Current Year	3	0.8564	0.0000
Value Reported in Prior Year	10	0.0093	0.0000

NV indicates a value could not be calculated because there is only one data element in the category or because total raw time is zero.

Appendix C

Table C-4: Example Evaluation of Options for Scaling, by Category

	Option 1: Raw Estimates/No Incidence Weighting ***(Sum of data elements= 21.43 hours)***		**Option 2: Incidence Weighting Included** ***(Sum of data elements= 7.06 hours)***		**Option 3: Scaled to Equal Nominal Form R for Raw or Incidence Weighted** ***(Sum = 35.7 hours)***		**Option 4: Scaled to Equal Nominal Form R Proportion of Calculations and Form Completion** ***(Sum = 20.4 hours)***	
	Rank (1-3)	**Comments**	**Rank (1-3)**	**Comments**	**Rank (1-3)**	**Comments**	**Rank (1-3)**	**Comments**
Internal Consistency	2	More consistent with old method (compared to incidence weighted estimates.)	3		1	More consistent with the new method moving forward.	NA	Equally consistent as Option3, but more consistent with total form unit burden
Parsimony	1	Easiest to generate using existing engineering burden estimates.	3	Requires information on how often data elements are filled out in a given year. Will have year to year variation.	2	Simply scaling from base.	NA	Simply scaling from base.
Intuitive Calculations	2	Based on real world experience with form.	1	Reflects the reality that not all facilities fill out all data elements.	3	Modeled estimate.	NA	requires explanation, given expectation that elements should add to total Form burden
Temporal Consistency	2		3	Requires information on how often data elements are filled out in a given year. Will have year to year variation.	1	More consistent with the new method moving forward.	NA	More consistent with the new method moving forward.
ICR Renewal Implications	3	Would be adding raw engineering estimate to back calculated nominal. Different bases.	2		1	Consistent with reporting burden for entire form (nominal form burden.)	NA	Consistent with reporting burden for appropriate portion of entire form (nominal form burden.)
EA Implications	1	Need to show non-incidence weighted burden in EA.	3		2	Can scale both raw and incidence weighted.	NA	Can scale both raw and incidence weighted.
Overall Rank	1.83		2.5		1.66		NA	

Appendix C

Appendix D

First-Time Filer Estimation

This appendix presents the First-Time Filer Estimation method of the Ratio-Based Burden Methodology (RBBM). As explained in Appendix A, first-time filer burden accounts for the elevated level of effort that reporters incur during a start-up year. The existing method estimates first-time filer burden in two instances. For ICR renewals, first-time filer burden is estimated as part of total Program burden to account for new entrants to the reporting community in any given reporting year. In RBBM terms, this estimate has a small effect on the Steady State Total Burden Calculation. Second, first-time filer burden is used in economic analyses (EAs) supporting rulemakings to evaluate the start-up effect of a policy or regulatory change to the TRI reporting requirements, for example, when a new sector is added to the reporting community. As noted in Appendix A, however, in the Ratio-Based Burden Methodology (RBBM), first-time filer burden now applies to calculating EA start-up burden only, as it was shown to be negligible in the overall Steady State Total Burden Calculation. First-Time Filer Estimation, as presented in Appendix A, is envisioned as working in conjunction with estimates of steady state burden as follows:

$$\textit{First-Time Filer Burden} = FTF_f * \textit{Relevant Steady State Total Burden}$$

Model Development for ICR Renewal Burden

As stated in Appendix B, neglecting the impact of first-time filing in the steady state estimate is justified mathematically because treating the relevant 3% of TRI chemical reports as steady state filers instead of first-time filers decreases the *Steady State Total Burden* estimate by .04%, based on 2008 ICR Renewal conditions. Therefore, with respect to ICR renewal burden estimates and the Steady State Burden Calculation, EPA has concluded that incorporating first-time filer burden has a negligible influence (see Appendix B).

Model Development for Economic Analysis Burden

In the context of EA work, EPA must estimate the incremental steady state and first-time impacts that a policy or regulatory change would have on TRI reporting. Depending on the proposed change, it may have significant first-time impacts when new reporters enter the TRI reporting universe or when existing reporters complying with a new aspect of TRI reporting are getting up to speed with the new policies or requirements. Therefore, when estimating the incremental impacts associated with a policy change or rulemaking, first-time filer burden must be estimated. It should be noted that first-time filer burden is a transient effect that will decrease to steady state burden levels in the second year.

First-Time Filer Model

Under the existing methodology, first-time burden is estimated using the same method as that used for steady state burden, i.e., using the two complex matrices and a separate count for first-time filers. As described in Appendix A, the Steady State Total Burden Calculation simplifies these calculations using ratio models and unit burdens from Abt Associates Engineering Studies. Using the same development process, EPA provides internal consistency between estimates for first-time and steady state reporting, as defined by the First-Time Filer factor, FTF_f):

Ratio of First-Time Burden to Steady State Burden	*[=]*	$\frac{\textit{First-Time Hours}}{\textit{Steady State Hours}}$

Computed using the factor matrices for Form R presented in Appendix A: [1]

$$FTF_f = \left(\sum_{i=1}^{4}\sum_{j=1}^{3} [\text{first year factors from } F''_{i,j}]\right) / \left(\sum_{i=1}^{4}\sum_{j=1}^{3} [\text{subsequent year factors from } F''_{i,j}]\right)$$

The FTF_f is developed using the ratio of the burden associated with first-time Form R reporting activities to the burden associated with steady state Form R reporting activities. See Appendix A's Eqn A-9 and Table A-4 for the model's specific calculation.

Findings

The recommended value for the First-Time Filer Factor, FTF_f, is 2.1 hr/hr, based on Form R factors. EPA estimated the FTF_f separately for Form R and Form A using several model assumptions and distribution conditions similar to the design for *A/R* tests described in Appendix B. Following Decision Rule #2 on page 10 of the main report, the Form R basis is used to apply for all instances in which first-time filing is estimated, given that the additional complexity of incorporating the Form A basis is unmerited. Table D-1 supports this decision as the difference in estimates based on Form R (FTF_R) versus those based on Form A (FTF_A) do not differ substantially.

[1] Where *i* denotes the row and *j* denotes the column from the Matrix F″ in Appendix A.

Appendix D

Table D-1: Estimation of First-Time Filer Factor for Form R and Form A

Test Run Description	(1) REFERENCE no simplifications	(2) Same as (1), but without First-time filer adjustment	(3) Same as (1), but without incidence rate adjustments	(4) Same as (1), but without distribution specificity*	(5) RECOMMENDED -realistic estimates with incidence rate adjustments**	(6) Robustness Test - alternate distribution***
Model Form R unit burden (hrs/Form R)	12.66	12.52	27.24	12.67	12.52	12.53
Model Form A unit burden (hrs/single -chemical Form A)	7.76	7.67	13.16	7.95	7.71	7.67
FTF_R	**2.05**	**2.05**	**1.67**	**2.08**	**2.05**	**2.06**
FTF_R % difference from Reference		0.00	-18.66	1.31	0.00	0.49
FTF_A	2.66	2.51	2.14	3.28	2.66*	2.53
A/R	**0.613**	**0.612**	**0.483**	**0.628**	**0.615**	**0.612**
A/R % difference from Reference		-0.12	-21.22	2.41	0.39	0.50

***** Does not account for potential double counting of facility level burden among facilities reporting both Form Rs and Form As.
******Current A, R, A+R distributions, no first-time filer adjustments. Based on the same conditions as for column 5 in Tables B-3 and B-4. See Eqn A-12 for FTF derivation.
*******Phase 2 Burden Reduction Rule.
Note: FTF_A is only 23% higher than FTF_R. According to Decision Rule # 2 in the main report Form R basis is used when complexity of Form A basis is unmerited.

Method Summary

Computation

For first-time incremental burden: As noted above, first-time filer burden is only addressed in the context of calculating EA start-up burden. Specifically, in any EA supporting a regulatory or policy change, there will be costs incurred only in the first year of the change, in addition to the sustained steady state costs associated with the change. Take, for example, the recent TRI rulemaking adding 16 chemicals to the list of reportable chemicals. To estimate first-time filer burden, the analyst will combine information on the unit burden associated with the filing of forms for the new chemicals, the number of new chemicals and the FTF_f. Note that in this rulemaking, reporters are not expected to file Form As for any of the new chemicals. The analyst would estimate first-time filer burden for the additional 186 Form Rs that are expected to be filed as follows:

Eqn D-2: *Total first-time filer burden associated with the rule adding 16 chemicals to TRI =*

*= FTF_f *(Form R Relevant Steady State Burden for New Chemicals + Form A Relevant Steady State Burden for New Chemicals)*

*= FTF_f * (Nominal Form R unit burden* # New Form R chemicals + [(A/R) * Nominal Form R unit burden] * # New Form A chemicals)*
= 2.1(35.7*186 + [.615*35.7]* 0)*

= 13,944 hours

This first-time filer burden estimate will be reported in the EA along with steady state burden as an estimate of the total burden associated with TRI reporting created by the proposed regulatory or policy change.

Assumptions

Use of the *FTF* model for estimating first-time filer burden relies on the following assumptions:

- First-time and steady state burden as currently identified in the Abt Associates Engineering Studies estimates for Form R is a reasonable reflection of the amount of time it takes to complete reporting activities for the first-time relative to the steady state for TRI reporting.
- The relationship between first-time and steady state burden does not vary between the steady state and policy/regulatory change scenarios or across policy/regulatory change scenarios.
- Relationships between reporting activities in the Abt Associates Engineering Studies that are drawn from a subpopulation are reasonably reflective of the true relationships in the total reporting population, as measured by the best professional judgment of Abt Associates' engineers.

Maintenance and Update Recommendations

The FTF model/method requires no maintenance. However, EPA notes that the *FTF* formulation is dependent on the conversion factors used to rescale facility-level unit burdens to (per chemical) form level. As shown in Appendix B, even in the face of dramatic shifts in distribution, *Equivalent Form R/A Chemicals per Facility* are reasonably robust, within about 10%. However, in the event that the program adds industry sector(s), the (per chemical) form/facility distribution could shift due to the addition of large chemical counts of substantially different distributions of (per chemical) form type and/or number of chemicals per facility.

As a practical matter, given the requirements for ICR renewal reporting, periodic recalculations of the *Equivalent Form R/A Chemicals per Facility* will be regularly available and can be checked to be sure that this basis for the FTF_f model (and others—*A/R* and *WAWR*) is still valid. EPA recommends this routine check.

Appendix E

Cost Conversion

This appendix presents the Cost Conversion method of Ratio-Based Burden Methodology (RBBM), including the weighted average wage rate (*WAWR*). *WAWR* provides and alternative to separately computing wages for the three labor categories, Managerial, Technical and Clerical, with each ICR renewal or rulemaking and instead specifies one up-front Cost Conversion incorporating all three labor categories. As presented in Appendix A, this method is envisioned as working primarily in conjunction with estimates of steady state burden as follows:

Eqn. E-1: *Steady State Total Cost = (Steady State Total Burden)*WAWR*

It should be noted that this method is the only method in the Ratio-Based Burden Methodology (RBBM) that calibrates with updates to actual economic conditions, given the availability of quarterly current wage data from the Bureau of Labor Statistics (BLS). It should also be noted that this method uses information from the Abt Associates Engineering Studies to set the relative proportions of each labor category reflecting current technology conditions. As with other similarly developed models (*A/R, FTE*), updates may be required in the event that large changes in the distributions of form counts/types across facilities affect the conversion factors (*Equivalent Form R/A Chemicals per Facility*). Unlike these other models, which have no impact on transitional baseline continuity, the WAWR under RBBM induces a slight one-time decrease (5%) to the baseline for the total cost estimate, while not affecting the relevant burden hour estimate.

Weighted Average Wage Rate (WAWR) Models

The WAWR ratio model determines costs associated with burden hour estimates, as defined by:

WAWR (Weighted Average Wage Rate): Average loaded cost for a mix of managerial, technical and clerical labor per hour of TRI reporter burden	*[=]*	*Current $/Hour*

This model uses one wage rate that reflects an average estimate for all labor categories as opposed to three different wage rates. The weighted hourly wage rate is developed by combining the relative contribution of each labor category to total burden with current hourly wages.

Procedure

As an example, to compute the steady state costs for Form R :[1]

[1] Form R burden only is used for initial illustrations, with verification of assumptions that the same bases apply to Form A and steady state total costs. See key analytical decisions in this Appendix. For additional details on Form R/A burden, and *Steady State Total Burden* calculations, see Appendix B.

Eqn. E-2: *Form R Cost = Form R Burden Hours* WAWR*

The *WAWR* for year *YR* is calculated as follows:

Eqn. E-3: $WAWR_{YR} = (p_m * \$/hr_{m,YR}) + (p_t * \$/hr_{t,YR}) + (p_c * \$/hr_{c,YR})$

Where

$WAWR_{YR} =$	*WAWR in current dollars for year YR*
$p_m,\ p_t,\ p_c =$	*proportions of the reporting burden for each labor category, managerial, technical and clerical.*
$\$/hr_{m,YR}, \$/hr_{t,YR}, \$/hr_{c,YR} =$	*The wage rates for managerial, technical and clerical labor for year YR, in current $/hour.*

For Form R, as in Form A, and the Total Cost calculation, the proportions are constant, providing fixed weights to the weighted average calculation:

Eqn. E-4: $WAWR_{YR} = (.03 * \$/hr_{m,YR}) + (.89 * \$/hr_{t,YR}) + (.08 * \$/hr_{c,YR})$

In this method, the burden is calculated in total and then multiplied by *WAWR*. Note that each labor category wage rate must be obtained for the quarter and year of interest.

Method Development

The key analytical decisions for developing this method include:

1. Specifying the set of fixed weights that represent the proportion of the reporting burden for each labor category: two options were considered: 1) weights developed using the unit burden estimates from the existing methodology, or 1) weights developed using the Abt Associates Engineering Studies. The fixed weights for Managerial, Technical and Clerical labor categories are 0.03, 0.89 and 0.08, based on the Abt Associates Engineering Studies, and 0.25, 0.68 and 0.07, based on the existing methodology, respectively. Both sets of weights were derived using Form R burden as a basis (see Decision Rule #2 on page 10 of the main report).
2. Determining if one *WAWR* can be used to convert From R, Form A, and total burdens to costs. This determination involved verifying the assumption that a Form A *WAWR* is not substantially different from a Form R *WAWR* in order to be able to use a standardized form *WAWR* for calculating required for Form R. It also involved verifying that the same *WAWR* could be applied to total burden to obtain total cost.
3. Recommending an update frequency.

Analyses to support these decisions are presented in order. The first set of analytical decisions specifies the basis for the proposed fixed weights for proportions of each labor category. Should EPA use existing methodology's proportions or those implied by the Abt Associates engineering estimates? Although RBBM has fully justified using the Abt Associates Engineering Study unit

burdens in ratio models (see Appendix B), in this particular method, the practice will induce a slight (5%) one-time baseline shift of $2.65/hour, from $52.27/hour (using the existing methodology) to $49.62/hour using RBBM. For many of the same reasons that the revised methodology uses the Abt Associates Engineering Studies unit burdens for *A/R* and *FTF,* they are preferred for *WAWR* as well. Advantages include internal consistency and the fact that these estimates were made in 2004, reflecting technology advances since program inception. EPA concludes that the slight one-time baseline shift for cost is acceptable, given the relative merits of using the same building blocks used throughout RBBM.

Consequently, the *WAWRs* used for RBBM have a modified formulation from that of the existing method because the RBBM fixed weights are derived using Abt Engineering Studies.. Recall that the OMB-approved implied weights are 0.25, 0.68, and 0.07 and that RBBM weights are 0.03, 0.89, and 0.08 (see Appendix A, Table A-4 for a breakdown by activity). The resultant RBBM weights as they apply to Form R reporting are presented in Table E-1 below.

Table E-1
Subsequent Year Reporting Burden – Per Form R Chemical

Activity	Management	Technical	Clerical
Rule Familiarization	0	0	0
Compliance Determination	0.069*	0.275*	0*
Calculations and Form Completion	0.320	6.890	0.0
Recordkeeping	0.000	4.000	1
Total Form level burden	**0.389**	**11.165**	**1**
Weights	**0.03**	**0.89**	**0.08**

*Facility-level factors converted to form (per chemical)-level factors via *Equivalent Form R Chemicals per Facility* (3.87) See Eqn A-10 and Tables A-3 and A-4.
Source: Table A-3, Abt Associates Engineering Studies (see Appendix B and references in Appendix G)

The second set of analytical decisions verifies that the derived Form R *WAWR* weights may be used for Form R burden, Form A burden, and total burden.

An analysis similar to the one presented in Table E-1 was conducted based on Form A, as derived from Form R, for reporting activities resulting in management, technical, and clerical weights of 0.03, 0.84 and 0.13, compared to Form R proportions of 0.03, 0.89 and 0.08, respectively. EPA concluded that Form A weights are similar enough to Form R weights to allow use of the Form R weights when computing Form A costs.

To assess *WAWR's* applicability to total burden, EPA then analyzed the effect of using the Form R *WAWR* to calculate total TRI reporting costs. EPA found that using the Form R based *WAWR* yields total cost estimates that are less than 0.2% higher than a total cost calculation that uses separate Form R and Form A WAWRs. Additionally, differences incurred by incorporating non-form burden are negligible.[2]

[2] This finding is based on an analysis of the per form comparable proportion of burden attributable to management, technical, and clerical under the following two scenarios: Total reporting burden (including non-form activities such as supplier notification and petitions) and form-related reporting burden only. In scenario one: total reporting burden, the weights are as follows: 24 management, .66 technical, and .09 clerical. In scenario two: form-related

Given the findings from these two analyses, EPA concludes that the Form R *WAWR* is equally applicable to Form R, Form A, and Steady State Total Cost estimates, using the weights for Form R for each labor rate category. To compute WAWR, the cost of each activity by labor category is developed by combining the burden in hours with hourly wage rates for the appropriate labor category. An example calculation is presented in Table E-2.

Table E-2
Derivation of Weighted Average Wage Rate ($/hour), June 2010

	Managerial	Technical	Clerical
Total Loaded Rate	$62.29	$51.37	$25.24
Weights	0.03 (3%)	0.89 (89%)	0.08 (8%)
Average Wage (weighted)	$49.62*		

Source: http://www.bls.gov/news.release/ecec.t11.htm
Note: For comparison, the Form A weighted average wage is $48.30.
* Individual numbers may not result in the total due to rounding.

The weighted average loaded hourly wage rate across the three labor categories was $49.62 in June 2010. This weighted average rate is applied to the total number of hours needed to complete Form R and Form A (Nominal Form R and Form A unit burden where Form A unit burden is derived from Form R unit burden using the A/R model) to estimate the unit cost per form. The cost per form is then applied to the total TRI total burden to estimate the total TRI reporting cost.

The third analytical decision involves recommending the frequency of updating the method. Since the information on wage rates is published quarterly by the Bureau of Labor Statistics (BLS), updates to the *WAWR* should be made accordingly.

Findings

The RBBM-consistent basis using Abt Associates engineering estimates are preferred for weighting labor categories within *WAWR*, for the same reason they are the basis for *A/R* and *FTF*. They provide benefits of internal consistency and reflect more current conditions with technology advances.

Method Summary

Computation

To update the *WAWR* for an ICR renewal or a major rulemaking, the following steps are involved:

reporting burden only, the weights are as follows: 25 management, .68 technical, and .07 clerical. Both calculations use 2008 ICR renewal estimates.

1. Obtain employer cost current wage rates for total and salary compensation[3] from BLS for three labor categories: Managerial, Technical and Clerical labor.[4] Adjust each upward to account for non-wage compensation: 17% overhead, 43.4% benefits.
2. Compute the weighted average wage rate, using the fixed weights reflecting burden hours (0.03, 0.89 and 0.08)[5] to calculate the current $WAWR_{2010}$ (e.g., $49.62/hour for June 2010).

The following equation presents the estimation of total burden when updating the *WAWR* for an ICR renewal or a major rulemaking using current wages from BLS (see Eqn B-2 for reference regarding *Steady State Total Burden*).

Eqn. E-5:

$$\textit{Steady State Total Cost} = \textit{Steady State Total Burden} * WAWR_{2010}$$

$$\textit{Steady State Total Cost} = (\textit{Nominal Form R Unit Burden}*\#\ \textit{Form R Chemicals} + [\textit{Nominal Form R Unit Burden}*(A/R)*\#\ \textit{Form A Chemicals}] + \textit{Non-Form Burden})*WAWR_{2010}$$

$$\textit{Total Cost} = (35.7*\#\ \textit{Form R Chemicals} + [35.7*.615*\#\ \textit{Form A Chemicals}] + 825{,}517)* WAWR_{2010}$$

Where $WAWR_{2010}$ *is calculated using Eqn. E-4 and the latest 2010 wage rates from BLS:*

$$WAWR_{2010} = (.03 * \$/hr_{\,m,2010}) + (.89 * \$/hr_{\,t,2010}) + (.08 * \$/hr_{\,c,2010})$$

Assumption

Wage rate proportions in WAWR of .03 for managerial labor, .89 for technical labor, and .08 for clerical labor are reasonable estimates of actual conditions, on average, for the overall reporting community.

Maintenance and Update Recommendations

Update *WAWR* in every burden estimate for which new information from BLS is available (quarterly updates). The fixed weights of *WAWR* require no maintenance. However, EPA notes that the values of these weights are dependent on the conversion factors used to rescale facility-level unit burdens to (per chemical) form level. As shown in Appendix B, even in the face of dramatic shifts in distribution, *Equivalent Form R/A Chemicals per Facility*, within about 10%. However, in the event that the program adds industry sector(s), the (per chemical) form/facility

[3] Note that benefits may be calculated as the difference between total and salary compensation on a quarterly basis (e.g., WAWR benefits are 43.4% of compensation for June 2010).
[4] Corresponding BLS titles: Managerial = Management, business, and financial; Technical = Professional and related; Clerical = Office and administrative support.
[5] See calculation components and results in Table E-1.

distribution could shift due to the addition of large chemical counts of substantially different distributions of (per chemical) form type and/or number of chemicals per facility.

As a practical matter, given the requirements for ICR renewal reporting, periodic recalculations of the *Equivalent Form R/A Chemicals per Facility* will be regularly available and can be checked to be sure that this basis for the fixed weights of the *WAWR* model (and others—*A/R* and FTF_f) are still valid. EPA recommends this routine check.

Appendix F

Program Staff Tool

Appendix F

DIRECTIONS:

The pink fields are user input cells. Your final estimates will be displayed in the dark green cells on this page. To see calculations and variables used in the interface, including models and accounting parameters, refer to the "Reference Information" tab. If you need to change or add form elements, refer to instructions and data under the "Form Element Estimates" tab.

DEFINITIONS:

Steady State Burden (SS) - estimate of ongoing Program burden, including permanent impacts from rulemakings, but absent first-time filer burden

First Time Filer Burden (FTF) - estimate to account for start-up burden incurred during the first year of a policy change

Weighted Average Wage Rate (WAWR) - consolidated wage rate that incorporates relevant proportions of managerial, technical, and clerical labor

Form R and Form A unit burdens - comprehensive unit burdens that incorporate all aspects of per chemical form-related burden, including: rule familiarization, compliance determination, calculations and form completion, and recordkeeping and submission

Section 1: UNIT BURDEN

1. If you are adding form elements for this analysis, estimate the burden of these new elements using the procedure in the "Form Element Estimates" tab. Then enter the sum of these estimates into the "Additional Burden per Form" user input cell. Note that for added form elements that only affect a subset of forms, we do not discount based on incidence rate.

2. If you do not have additional form elements for this analysis, make sure the number in the "Additional Burden per Form" cell is 0.

Note: The newly calculated Form R Unit Burden will be used to calculate both total Form R and total Form A burden.

Section 2: CHEMICAL COUNTS

Complete this section according to whether you are estimating the full model (ICR) or incremental model (EA).

In the case of an ICR, enter the number of chemicals reported by Form A and Form R, or in the case of an EA, enter the change in the number of chemicals reported by Form A and Form R in the "Incremental Change" input cells in Section 2.

Section 3: STEADY STATE BURDEN ESTIMATES

This section displays the final estimates in the dark green cells. For an ICR use the "Final Totals" and for an EA use the "Final Incremental Change."

Section 4: FIRST YEAR ADDITIONAL BURDEN DUE TO FIRST-TIME FILERS (FTF)

For EAs that initiate policy change that in turn causes a startup burden for first-time filers (FTF), enter the number of additional Form R and Form A chemicals in this section to determine this burden due to FTFs.

Appendix F

Key

Models (see reference tab)	
User inputs	
Calculated numbers	
Final estimates	
Intermediate Calculations	
Helpful hints	

USER INPUTS AND MODELS						ESTIMATES
Section 1: UNIT BURDEN	**Starting Point**		**Additional Burden per Form**			**New Form R Burden Total**
Form R unit burden (hours per form)	35.7	+	0	=		35.7
Form A unit burden (hours per single-chemical form)	22.0	+	0	=		22.0
Form A unit burden = (A/R) * Form R unit burden						

Section 2: CHEMICAL COUNTS					
Number of Chemicals	**Starting Point**		**Incremental Change**		**Chemicals Total**
Number chemicals reported on Form R	81,382	+	0	=	81,382
Number of chemicals reported on Form A	9,284	+	0	=	9,284
Note: Form A is units of chemicals rather than responses					

Section 3: STEADY STATE BURDEN ESTIMATES

Hours of Form Burden	Starting Point		Incremental Change		New Burden Hours Total
Total Form R Burden (hrs)	2,905,337	+	0	=	2,905,337
Total Form A Burden (hrs)	203,835	+	0	=	203,835
Total Non-form Burden (hrs)	825,517				825,517

Note: Incremental change numbers in section 3 include new forms and any changes in form unit burden.

Totals and Cost Conversion		Final Incremental Change	Final Totals
WAWR (current $/hr)	49.62		
Total Burden (hrs)		0	3,934,689
Total Cost (dollars)	(Total Burden in hrs) * (June 2010 $ WAWR) =	$0	$195,231,097

Section 4: FIRST YEAR ADDITIONAL BURDEN DUE TO FIRST TIME FILERS (FTF)

		Incremental Change
# of chemicals reported on Form R for FTFs		0
# of chemicals reported on Form A for FTFs		0
FTF Form R Burden (hrs)	Form R Unit Burden * FTF # Form R Chemicals * FTF Factor =	0
FTF Form A Burden (hrs)	Form A Unit Burden * FTF # Form A Chemicals * FTF Factor =	0
FTF Total Burden (hrs)		0
FTF Total Cost (dollars)	(FTF Burden in hrs) * (June 2010 $ WAWR)=	$0

Reference Equations and Model Values

Equations used in Estimator:

Total Burden = Form R Burden + Form A Burden + NonForm Burden

Where:

Form R Burden = (# Form R chemicals) * (Nominal Form R Unit Burden)

Form A Burden = (# Form A chemicals) * (A/R) * (Nominal Form R Unit Burden)

NonForm Burden = (Petitions) + (Supplier Notification) + (Non-Reporters' Burden)

Total Cost = Total Burden * (WAWR)

Where:

WAWR is the weighted average wage rate in current dollars/hr

First Time Filer Burden = (FTF_f * relevant steady state burden)

Where:

FTF_f = the first time filer factor

relevant steady state burden = [(# new Form R chemicals * Nominal Form R unit burden)] + [(# new Form A chemicals * Nominal Form R unit burden * (A/R))]

Appendix F

Table 1. Values used in Estimator						
Update Frequency	**Last Updated**	**Name**		**Value**	**Units**	**Description**
MODEL PARAMETERS						
According to Tolerances	May 2010	**A/R Model**	=	0.615	hrs/hrs	A ratio of burdens for single-chemical Form A to Form R.
None by Schedule	May 2010	**Petitions**	=	925	hrs	Non-form burden, assumes 5 petitions per year 185 hours per petition.
None by Schedule	May 2010	**Supplier Notification**	=	89,616	hrs	Non-form burden, can apply to any facility but basis is 24 hours per reporting facility as of 2008 ICR.
None by Schedule	May 2010	**Non-Reporter Compliance Determination**	=	734,976	hrs	Non-Form burden, assumes 4 hours compliance determination to all in NAICS with over 10 employees as of 2008 ICR.
According to Tolerances	May 2010	**First Time Filer Factor (FTF_f)**	=	2.1	hrs/hrs	A ratio of the first-time filer burden to steady state burden.
WAWR						
Quarterly	June 2010	**Weighted Average Wage Rate (WAWR)**	=	$49.62	$/hr	Dollars per hour ratio that incorporates managerial, technical, and clerical labor rates. Note: to update the WAWR, refer to the guidance below.
REFERENCE INFORMATION						
As Form Changes are Implemented in Rulemakings and ICRs (note: verify Rulemaking estimates at ICR)	Feb 2011	**Nominal Form R Unit Burden**	=	35.7	hrs	Current Base number for Form R burden, given the form elements approved at most recent action (ICR or Rulemaking).
At Every ICR	Feb 2011	**Form R Chemicals per Facility**	=	3.68	chems/facility	Based on number of chemicals per facility.
At Every ICR	Feb 2011	**Form A Chemicals per Form**	=	2.31	chems/Form A	Based on number of chemicals per form, which is assumed to be number of chemicals per facility.

Guidance to Update the WAWR:

The WAWR is a dollar per hour ratio that is based on the managerial, technical, and clerical labor rates from the Employer Cost for Employee Compensation Economic update published quarterly by the BLS.

To update the WAWR with the latest data from BLS, enter the most recently published values for Total Compensation and Wages and Salaries in the table titled Employer Cost for Employee Compensation under the appropriate date. The Benefits column will automatically calculate the Benefit amount for each labor type. The table titled WAWR will then generate the new WAWR and present it under the appropriate date.

To use the new WAWR in the Estimator tab, update the reference formulas for $/hr and date in cells F30 and C30 to link to the new WAWR and date. (For example, when updating to a September 2010 WAWR, cell F30 would be linked to F60 and cell C30 would be linked to F56.)

Appendix F

Table 2. WAWR Calculation

WAWR

Date	*December 2009*	*March 2010*	*June 2010*	*September 2010*
Managerial	$61.42	$62.32	$62.29	
Technical	$50.51	$51.17	$51.37	
Clerical	$24.99	$25.22	$25.24	
WAWR	**$48.81**	**$49.44**	**$49.62**	

EMPLOYER COST FOR EMPLOYEE COMPENSATION

Date	*December 2009*			*March 2010*			*June 2010*		
Compensation Component	**Total Compensation**	**Wages and Salaries**	**Benefits**	**Total Compensation**	**Wages and Salaries**	**Benefits**	**Total Compensation**	**Wages and Salaries**	**Benefits**
Managerial	$54.91	$38.30	$16.61	$55.73	$38.75	$16.98	$55.69	$38.84	$16.85
Technical	$45.04	$32.16	$12.88	$45.63	$32.59	$13.04	$45.81	$32.73	$13.08
Clerical	$22.33	$15.65	$6.68	$22.55	$15.73	$6.82	$22.56	$15.75	$6.81

Note: Corresponding BLS titles: Managerial = Management, business, and financial; Technical = Professional and related; Clerical = Office and administrative support. Total Compensation and Wages and Salaries data is taken directly from ECEC, while Benefits data is derived from the ECEC data.

Source: Employer Cost for Employee Compensation, Table 9. BLS. <http://www.bls.gov/news.release/ecec.t11.htm>

September 2010		
Total Compensation	**Wages and Salaries**	**Benefits**

OVERHEAD

17%

LABOR BURDEN WEIGHTS

Managerial	0.03
Technical	0.89
Clerical	0.08

FORM R

EPA **United States Environmental Protection Agency**	**FORM R** Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also Known as Title III of the Superfund Amendments and Reauthorization Act	TRI Facility ID Number Toxic Chemical, Category or Generic Name
WHERE TO SEND COMPLETED FORMS:	1. TRI Data Processing Center P. O. Box 1513 Lanham, MD 20703-151	2. APPROPRIATE STATE OFFICE (See instruction in Appendix E)
This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave bank.	**Revision (enter up to two codes(s))**	**Withdrawal (enter up to two code(s))**
IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.		
PART 1. FACILITY IDENTIFICATION INFORMATION		

NOTE:
For further details of this form image see Appendix A, Figure A-2.

Appendix G
Abt Associates Engineering Studies

1) TRI Reporting Burden Estimates, Memo from Hilary Eustace, David Cooper, Susan Day, Abt Associates to Paul Borst, EPA, July 16, 2004
2) Modified TRI Reporting Burden Estimates for Rule Familiarization, Compliance Determination, and Form Completion from Susan Day, Abt Associates to Laura Nielsen, EPA, December 2, 2010

NOTICE

Abt Associates Engineering Estimates in Ratio-Based Burden Methodology (RBBM)

As explained in *Methodology History*, the Abt Associates engineering estimates were proposed in 2004, but neither finalized nor formally adopted into TRI burden estimation practice. In this methodology revision and in the formulation of RBBM, EPA uses the estimates for a different purpose than originally intended. Instead of using Abt Associates engineering estimates as a basis for absolute values (i.e., the *Nominal Form R unit burden*), RBBM uses the estimates to construct ratio models of key relationships (e.g., *A/R*), thereby only relying on the relative values of the estimates and not absolute values.

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Abt Associates Inc.

M E M O R A N D U M

TO: Paul Borst, U.S. EPA

FROM: Hilary Eustace, David Cooper, Susan Day

DATE: July 16, 2004

RE: TRI Reporting Burden Estimates

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1. INTRODUCTION

EPA currently relies on previously developed OMB approved TRI reporting burden estimates that reflect the total time required by facilities to complete activities such as rule familiarization, compliance determination, form completion, record keeping/mailing, and supplier notification. While form completion reporting burden estimates have been prepared for completion of the full Form R, the total time is not broken down by the individual data elements that make up the form. Data element specific burden estimates would allow for informed assessments and comparisons of proposed TRI burden reduction methods as well as any future proposed Form R modifications. In this memo, burden estimates are derived for every data element on the Form R based on the activities TRI reporters undertake to complete each data element as well as the time estimates for technical, managerial, and clerical staff at a *typical* facility to conduct these activities. During the last TRI ICR renewal, EPA referenced industry data suggesting that TRI reporting burden is lower than previously estimated. While the newly negotiated burden estimates were revised downward for non-PBT chemicals, they were not lowered by as much as EPA proposed. Furthermore, PBT chemical reporting burden was not lowered at all. The OMB approved reporting estimates are presented in Table 1. The data element specific burden estimates presented in this memo are estimated first to reflect the time it actually takes the typical facility to fill out each data element. This burden is referred to as the "realistic burden." Second, the data element specific realistic burden estimates are scaled up so that summing them yields the OMB approved burden estimate of form completion. Several sets of burden estimates were prepared, including times for both electronic and paper form preparation for every category outlined below:

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- **Realistic Burden Estimates for Every Form R Data Element:** Realistic burden estimates were prepared for every data element on the Form R based on best engineering judgment for both management and technical time. Under the realistic scenario, no clerical time is spent on form completion. Separate realistic burden estimates were prepared for non-PBT and PBT chemicals.
- **Realistic Burden Estimates for Total Form R Completion:** The realistic data element burden estimates were weighted by the incidence rate, which is the total percentage of forms containing information other than "NA" for the data element, in order to reflect the fact that not all data elements will be completed on all forms. The incidence rate was calculated using the frozen RY 2002 TRI data. This analysis was conducted separately for non-PBT and PBT chemicals.
- **Scaled Burden Estimates for Every Form R Data Element for non-PBT Chemicals**: The realistic burden estimates generated for every data element for non-PBT chemicals were scaled up to meet the current OMB-approved time estimate for calculations and form completion for a Form R for a non-PBT chemical.
- **Scaled Burden Estimates for Every Form R Data Element for PBT Chemicals**: The realistic burden estimates generated for every data element for PBT chemicals were scaled up to meet the current OMB-approved time estimate for calculations and form completion for a Form R for a PBT chemical. Since the current OMB-approved time estimate for calculations and form completion for a PBT chemical assumes that all data elements are completed, these scaled data element time estimates were not multiplied by the incidence rate for PBT chemicals.

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TABLE 1
OMB-APPROVED TIME ESTIMATES FOR FORM R
CALCULATIONS/FORM COMPLETION

Activity	Management	Technical	Clerical	Total Hours
First year				
Calculations and report completion - non-PBT chemicals	11.3	24.1	1.6	37.0
Calculations and report completion - PBT chemicals	20.9	45.2	2.9	69.0
Subsequent years				
Calculations and report completion - non-PBT chemicals	7.7	16.4	1.1	25.2
Calculations and report completion - PBT chemicals	14.3	30.8	2.0	47.1

Source: Rice, Cody Memo: Terms of Clearance for TRI ICR Renewal. Jan 20, 2004.
An OMB-approved estimate for first time non-PBT filers does not exist; however, the RIA for the original Section 313 rulemaking estimated the time required to complete a report in the first year to be 147% of the time required in subsequent years. This factor was applied to the OMB approved subsequent year non-PBT report completion times to calculate the first year non-PBT completion times. (U.S. EPA Regulatory Impact Analysis in Support of Final Rulemaking under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (1988).

Realistic estimates, based on best engineering judgment, are presented in Section 2; Section 3 presents the realistic estimate scaled to the OMB approved Form R completion times. Within each section, PBT and non-PBT reporting burden is examined separately due to differences in methodology. The PBT and non-PBT chemical sub-sections are further divided into electronic and paper methodology and results sub-sections.

2. REALISTIC REPORTING BURDEN ESTIMATES

2.1.A. Methodology for Electronic Submission

The basis for all of the burden estimates presented in this memo start with a realistic burden estimate for a typical facility to prepare a Form R in the first year and all subsequent reporting years. To generate this realistic burden estimate, the method described below was utilized. First, the steps required for completion of each data element (field) on the Form R were identified. Best engineering judgment was used to estimate the time to complete each step based on a

reasonable and likely scenario for conducting the needed steps a typical facility. Best engineering judgment was provided by a team of three staff with nearly 40 years of combined experience working with facilities on environmental issues. These staff have worked with hundreds of facilities on TRI reporting and other environmental requirements by conducting inspections and providing technical assistance to hundreds of facilities, serving as TRI trainers, conducting technical review on hundreds of TRI data withdrawal requests, conducting hundreds of TRI data quality calls, working for two of the Massachusetts Toxics Use Reduction Act agencies, and working as environmental staff at large manufacturing facilities.) Next, the total time to complete each data element was estimated by summing together the labor hours required to complete the set of steps necessary for each data element.

Best and worst-case scenarios of activities were considered when estimating the time required to complete each step. The time estimates presented here reflect the most typical/likely scenario. For example, scenarios to identify average discharge water flow rate range from transcribing dozens of hand-written entries from manual meter observation to simply pulling this piece of data from a fully-automated system. The likely scenario selected is that the typical facility will have at least partial automation on data capture from their flow meter, but technical staff will likely have to pull multiple pieces of information, interpret this information, and perform a few calculations. Several Form R data elements will require the same or similar activities. To ensure consistency, times were standardized for these activities. These standard times are presented in Table 2 (refer to Excel spreadsheet).

For Form R data elements requiring a quantitative estimate of release or other waste management quantities, the steps a facility would take to fill in the data elements were derived based on the most common basis of estimate code reported for that field in the RY 2002 TRI data. The basis of estimate code analysis is presented in Table 3 (refer to Excel spreadsheet). For example, monitoring data was the most common basis of estimate code for off-site transfers to POTWs; therefore, the steps required to make engineering calculations based on monitoring data were used as the basis for the time estimate for this data element. In actuality, each facility would use their best available data for completing each field. As a final check, estimated times for data elements were compared with one another based on expected relative degree of difficulty.

The total realistic form completion burden was calculated by combining the time required to complete each data element with the percent of times individual data elements are typically completed. As mentioned above, this adjustment was made by weighting the data element specific burden by the incidence rate for that element. For example, if a stack air release quantity (either “0" or an actual quantity) was reported on 50% of all non-PBT Form Rs, the time estimated to complete Part II, Section 5.2 of the Form R was multiplied by 50%. For data elements that are required, it was assumed that 100% of forms had the data element filled out. The final reporting burden is a realistic estimate of the total form completion time based on engineering judgment. A separate analysis was done for non-PBT and PBT chemicals.

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As mentioned above, these burden estimates are based on the TRI reporting experiences of a *typical* facility. It was, therefore, necessary to make the following assumptions about a typical facility:

- The facility is reasonably modern and well-organized.
- The facility has internet access with reasonable connection speed.
- Through rule familiarization, the technical staff are aware that written EPA TRI guidance is available through the website.
- Unless otherwise noted, the set of activities listed for a release estimate need only be conducted once.
- Unless otherwise noted, there is no difference in completing a data element for non-PBT versus PBT chemicals. (Additional discussion on PBTs versus non-PBTs is provided below).
- Technical staff retain copies of the previous year's reports in a readily available format. Therefore, static information available from the previous year's reports, such as RCRA I.D., is assumed to require only typing time in subsequent years.
- For subsequent year reports, technical staff will be able to locate, review, and interpret information needed to prepare release and other waste management estimates more quickly since they have already gone through the process.
- For subsequent year reports, it is assumed that there are no significant changes to facility operations or waste management practices.
- Technical staff preparing the report will concurrently type this information into TRI-ME and will not require clerical assistance in entering information into TRI-ME.
- On the paper form estimates of reporting burden, clerical time consists entirely of typing hard copy Form Rs; no other activities are undertaken. For example, technical staff conduct all of the needed research for preparing the form.

Since more than 80% of Form Rs were filed electronically in RY 2002, it is assumed for the realistic burden estimate that technical staff prepare the electronic form; therefore, no clerical burden is estimated. Also, in the realistic burden estimate, management review time is based on the maximum perceived level of management involvement at reporting facilities and is lower than previous OMB approved management burden estimates. In the following sections, data elements are presented as they appear on the Form R. Reporting burden estimates are presented after each step for first year/subsequent years in minutes. If a step will take less time or does not

need to be repeated in subsequent years, this will be reflected in the allotted time (i.e., a lower time or "0" will be given for subsequent years).

As mentioned above, the calculations/form completion burden for non-PBT chemicals was recently revised from 47.1 hours to 25.2 hours for non-PBT chemicals (Memo from Cody Rice to Amy Newman: Terms of Clearance for TRI ICR Renewal. Jan 20, 2004). Reporting burden associated with PBT chemicals was not revised due to trade association comments suggesting that because range reporting and the *de minimis* exemption cannot be used for PBT chemicals, form completion takes longer for a PBT chemical than a non-PBT chemical. While there may be overall differences in TRI reporting burden between PBT and non-PBT forms, this difference is largely due to compliance determination activities, not form completion.

Specifically, the *de minimis* exemption is not allowed for PBT chemicals. Therefore, compliance determination may take longer for PBT chemicals, as additional mixtures may need to be assessed for threshold quantity. It does not appear, however, that the lack of the *de minimis* exemption will increase the burden associated with making release estimates due to a need to assess additional waste streams. An analysis of the RY 2002 TRI data indicated that the average number of reported "M" codes for off-site transfers was slightly lower for PBTs than for non-PBTs (2.55 versus 2.64, respectively). Assuming that different waste streams are indicated by different waste management methods, as indicated by the "M" code, it appears that there were slightly fewer differing waste streams for PBT chemicals than for non-PBT chemicals.

Also, not being able to use range reporting does not actually increase the reporting burden for PBT filers. Range reporting is allowed for non-PBT chemicals in Part II, Sections 5 and 6 of the Form R (on-site releases and off-site transfers of wastes), but is not allowed in Part II, Section 8 of the Form R. All release and other waste management quantities from Sections 5 and 6 are also recorded in Section 8 of the Form R, therefore, actual estimates (versus range estimates) for Sections 5 and 6 must be made to complete Section 8. As a result, no fewer calculations are necessary to complete a Form R for non-PBTs versus PBTs due to range reporting. In addition, range reporting is only allowed for releases less than 1,000 pounds, and calculations are needed to determine which range is applicable.

As shown below, using best engineering judgment, there does not appear to be a significant difference between calculations/form completion activities and burden for PBT versus non-PBT chemicals. In fact, it is estimated that the calculations/form completion time for PBT chemicals is slightly lower, primarily due to the fact that more EPA-published quantitative guidance is available for PBT chemicals, such as emission factors. Analysis of RY 2002 TRI data shows the following:

- The most commonly reported basis of estimate codes were nearly identical for PBTs versus non-PBTs.

- The percent of data elements filled out by RY 2002 filers was nearly the same for PBT and non-PBT forms, with the difference being the percent was slightly lower for PBTs.

- For data elements where multiple occurrences were reported (e.g., off-site transfer locations, number of "M" codes for off-site transfers, number of reported on-site treatment waste streams), the incidence rates were nearly identical for PBT and non-PBT forms.

The derivation of the data element specific burden estimates is presented below. Only one complete set of steps reflecting expected activities for both PBT and non-PBT chemicals is provided for each data element (with a few minor exceptions) as there are no significant differences in form completion activities. Minor differences expected between non-PBT and PBT chemicals are noted in the individual data element discussions where they occur.

Data Element Specific Reporting Burden

Form R, Part I. Facility Identification Information

Section 1: Reporting Year

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will have knowledge of this information and will report it in Part I, Section 1 of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part I, Section 1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.25	0.25
Total	0.33	0.33

Section 2: Trade Secret Information

2.1 Are you claiming the toxic chemical identified on page 2 trade secret?
Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will have knowledge of this information and will check yes or no in Part I, Section 2.1 of the Form R. (0.08 min/0.08 min)

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Reporting Burden Associated with Part I, Section 2.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.08	0.08
Total	0.16	0.16

2.2 Is this copy sanitized or unsanitized?

Facilities must meet rigorous standards as outlined in 40 CFR 350 in order to claim trade secret status; therefore, it is assumed a typical facility will check "no" in Part I, Section 2.1 of the Form R, and subsequently Part I, Section 2.2 of the Form R will be left blank.

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will have knowledge of this information and will check yes or no in Part I, Section 2.2 of the Form R. (0.08 min/0.08 min)

Reporting Burden Associated with Part I, Section 2.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.08	0.08
Total	0.16	0.16

Section 3: Certification

In RY 2002, more than 80% of Form R reports were filed via diskette or CDX submission. Electronic signature occurs as part of the CDX submission process and with diskette submission a separate signed letter is sent. Burden for this effort is allocated under "Record keeping/Mailing" and therefore is not included in the "Calculations/Form Completion" burden estimate outlined in this report. Thus, no management, technical, nor clerical burden associated with this element of the Form R will be allocated for this analysis.

Section 4.1: Facility Identification (Name, Address)

Management burden includes proofreading this section as part of an overall review of the Form R. (0.67 min/0.67 min)

Technical staff will have knowledge of this information and will report it in Part I, Section 4.1 of the Form R. (2.0 min/0 min)

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Reporting Burden Associated with Part I, Section 4.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.67	0.67
Technical	2.00	0.00
Total	2.67	0.67

Section 4.2: Reporting by Part

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

4.2a or 4.2b

Technical staff will have knowledge of this information, and will check off if this Form R is for an entire facility or part of a facility in Part I, Section 4.2a or 4.2b, respectively, of the Form R. (0.08 min/0.08 min)

Reporting Burden Associated with Part I, Section 4.2a or 4.2b

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.08	0.08
Total	0.16	0.16

4.2c or 4.2d

This section is only filled out if the Form R is from a federal facility or a government-owned, contractor-operated (GOCO) entity conducting work on behalf of the federal government. Since fewer than 5% of Form Rs are filled out by these facilities, this section will typically be left blank.

Technical staff will have knowledge of this information, and will check off if this Form R is for a federal facility or a GOCO in Part I, Section 4.2c or 4.2d, respectively, of the Form R. No time is included for this step because it is filled out less than 5% of the time.

Section 4.3: Technical Contact Information (Name, Address, E-mail, Telephone)

Management burden includes proofreading this section as part of an overall review of the Form R. (0.25 min/0.25 min)

Technical staff will have knowledge of this information and will report it in Part I, Section 4.3 of the Form R. (0.75 min/ 0 min)

Reporting Burden Associated with Part I, Section 4.3

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.25	0.25
Technical	0.75	0.00
Total	1.00	0.25

Section 4.4: Public Contact Information (Name, Telephone)

Management burden includes proofreading this section as part of an overall review of the Form R. (0.17 min/0.17 min)

Technical staff will have knowledge of this information and will report it in Part I, Section 4.4 of the Form R. (0.50 min/0 min)

Reporting Burden Associated with Part I, Section 4.4

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.17	0.17
Technical	0.50	0.00
Total	0.67	0.17

Section 4.5: SIC Code(s)

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

As an integral part of compliance determination, a facility will have determined which SIC codes apply to the facility. Technical staff simply record this information in Part I, Section 4.5 of the Form R. (0.25 min/0 min)

Reporting Burden Associated with Part I, Section 4.5

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.25	0.00
Total	0.33	0.08

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Section 4.6: Latitude/Longitude

Management burden includes proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Technical staff will go to the TRI facility siting tool available on the EPA Web site and type in their facility address. The tool will then report back the latitude and longitude. The technical staff will record this information in Part I, Section 4.6 of the Form R. (4.5 min/0 min)

Reporting Burden Associated with Part I, Section 4.6

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.50	0.50
Technical	4.50	0.00
Total	5.00	0.50

Section 4.7: Dun & Bradstreet Number

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will obtain this information from elsewhere in the company by making a phone call, checking files, or making an in-person information request. Once obtained, technical staff will record this information in Part I, Section 4.7 of the Form R. (10.0 min/0 min)

Reporting Burden Associated with Part I, Section 4.7

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	10.00	0.00
Total	10.08	0.08

Section 4.8: EPA Identification Number (RCRA ID)

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Unless hazardous waste manifests are stored with the technical staff preparing the report, they will need to obtain this information from elsewhere in the company by making a phone call, checking files, or making an in-person information request. For the purposes of this estimate, it is assumed that technical staff will need to obtain this information from elsewhere. Once

obtained, technical staff will record this information in Part I, Section 4.8 of the Form R. (10.0 min/0 min)

Reporting Burden Associated with Part I, Section 4.8

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	10.00	0.00
Total	10.08	0.08

Section 4.9: Facility NPDES Permit Number

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Unless NPDES permit documents are stored with the technical staff preparing the report, they will need to obtain this information from elsewhere in the company by making a phone call, checking files, or making an in-person information request. For the purposes of this estimate, it is assumed that technical staff will need to obtain this information from elsewhere. Once obtained, technical staff will record this information in Part I, Section 4.9 of the Form R. (10.0 min/0 min)

Reporting Burden Associated with Part I, Section 4.9

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	10.00	0.00
Total	10.08	0.08

Section 4.10: Underground Injection Well Code (UIC I.D.)

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Unless UIC permit documents are stored with the technical staff preparing the report, they will need to obtain this information from elsewhere in the company by making a phone call, checking files, or making an in-person information request. For the purposes of this estimate, it is assumed that technical staff will need to obtain this information from elsewhere. Once obtained, technical staff will record this information in Part I, Section 4.10 of the Form R. (10.0 min/0 min)**.**

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Reporting Burden Associated with Part I, Section 4.10

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	10.00	0.00
Total	10.08	0.08

Section 5.1: Name of Parent Company

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will need to obtain this information from elsewhere in the company by making a phone call, checking files, or making an in-person information request. Once obtained, technical staff will record this information in Part I, Section 5.1 of the Form R. (10.0 min/0 min)

Reporting Burden Associated with Part I, Section 5.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	10.00	0.00
Total	10.08	0.08

Section 5.2: Parent Company's Dun & Bradstreet Number

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will need to obtain this information from elsewhere in the company by making a phone call, checking files, or making an in-person information request. Once obtained, technical staff will record this information in Part I, Section 5.2 of the Form R. (10.0 min/0 min)

Reporting Burden Associated with Part I, Section 5.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	10.00	0.00
Total	10.08	0.08

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Form R, Part II. Chemical-Specific Information

Section 1.1: CAS Number

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will have the CAS Number readily available from activities conducted during compliance determination, such as review of Material Safety Data Sheets (MSDSs) or review of the EPCRA Section 313 chemical list, and report it in Part II, Section 1.1 of the Form R. (0.25 min/0 min)

Reporting Burden Associated with Part II, Section 1.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.25	0.00
Total	0.33	0.08

Section 1.2: Toxic Chemical or Chemical Category Name

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff will have the chemical name readily available from activities conducted during compliance determination, such as review of Material Safety Data Sheets (MSDSs) or review of the EPCRA Section 313 chemical list, and report it in Part II, Section 1.2 of the Form R. (0.25 min/0 min)

Reporting Burden Associated with Part II, Section 1.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.25	0.00
Total	0.33	0.08

Section 1.3: Generic Chemical Name

Facilities must meet rigorous standards as outlined in 40 CFR 350 in order to claim trade secret status; therefore, this section of the Form R is not typically used. If a facility meets the standard for trade secret status, this section of the Form R is completed instead of Part II, Sections 1.1 and 1.2. If this section is used, management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff would create a generic, structurally descriptive chemical name and report it in Part II, Section 1.3 of the Form R. (0.50 min/0 min)

Reporting Burden Associated with Part II, Section 1.3

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.50	0.00
Total	0.58	0.08

Section 1.4: Distribution of Each Member of the Dioxin and Dioxin-Like Compounds Category

This section of the Form R is left blank unless the chemical is dioxin and dioxin-like compounds. Therefore, for Form Rs for all other chemicals there is no management, technical, nor clerical burden associated with this element. If the Form R is for dioxin and dioxin-like compounds, management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

Technical staff would most likely obtain the distribution of each member of the dioxin and dioxin-like compounds category for the appropriate activity from EPA's document "EPCRA Section 313 Guidance for Reporting Toxic Chemicals Within the Dioxin and Dioxin-like Compounds Category" and report it in Part II, Section 1.4 of the Form R. (5 min/2 min)

Reporting Burden Associated with Part II, Section 1.4

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	5.00	2.00
Total	5.08	2.08

Section 2.1: Generic Chemical Name Provided by Supplier

This section of the Form R is only completed if the facility's chemical supplier meets the standard for trade secret status and is therefore not typically used. If the material supplied meets the standard for trade secret status, this section of the Form R is completed instead of Part II, Sections 1.1 and 1.2. If this section is used, management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/ 0.08 min)

Technical staff would have the generic chemical name provided by the supplier readily available from activities conducted during compliance determination, such as review of Material Safety Data Sheets (MSDSs), and report it in Part II, Section 2.1 of the Form R. (0.25 min/0 min)

Reporting Burden Associated with Part II, Section 2.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.25	0.00
Total	0.33	0.08

Section 3.1: Manufacture the Toxic Chemical

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

As an integral part of compliance determination, the facility becomes familiar with the EPCRA Section 313 threshold activities that the chemical was involved in during the reporting year. Therefore, technical staff simply check off the relevant descriptions of manufacturing activities for the chemical presented in Part II, Section 3.1 of the Form R. (0.08 min/0 min)

Reporting Burden Associated with Part II, Section 3.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.08	0.00
Total	0.16	0.08

Section 3.2: Process the Toxic Chemical

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

As an integral part of compliance determination, the facility becomes familiar with the EPCRA Section 313 threshold activities that the chemical was involved in during the reporting year. Therefore, technical staff simply check off the relevant descriptions of processing activities for the chemical presented in Part II, Section 3.2 of the Form R. (0.08 min/0 min)

Appendix G
Reporting Burden Associated with Part II, Section 3.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.08	0.00
Total	0.16	0.08

Section 3.3: Otherwise Use the Toxic Chemical

Management burden includes proofreading this section as part of an overall review of the Form R. (0.08 min/0.08 min)

As an integral part of compliance determination, the facility becomes familiar with the EPCRA Section 313 threshold activities that the chemical was involved in during the reporting year. Therefore, technical staff simply check off the relevant descriptions of otherwise use activities for the chemical presented in Part II, Section 3.3 of the Form R. (0.08 min/0 min)

Reporting Burden Associated with Part II, Section 3.3

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.08	0.08
Technical	0.08	0.00
Total	0.16	0.08

Section 4.1: Maximum Amount of the Toxic Chemical On-Site at any Time During the Calendar Year

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.08 min/ 0.91 min)

The maximum amount of toxic chemical on-site at any point during the year is reported as a range code, with each range representing one order of magnitude. To determine the range estimate for the maximum amount of the toxic chemical in storage, in process, and in on-site wastes at any one point during the year, it is assumed the technical staff performs the steps outlined below. The estimate is needed to identify a quantity within a very broad range, not to identify a more exact quantity. For this reason, steps outlined here will take less time than when conducted for a data element requiring a more precise estimate.

- Determine the maximum quantity of the toxic chemical in storage at any point during the calendar year by either reviewing inventory records or talking with operations staff. (9.00 min/9.00 min)

- Determine the maximum quantity of the toxic chemical in process at any point during the calendar year by either reviewing operations records or talking with operations staff. (9.00 min/9.00 min)

- Determine the maximum quantity of the toxic chemical in on-site wastes at any point during the calendar year by either reviewing waste records, such as hazardous waste manifests, or talking with operations staff. (9.00 min/9.00 min)

- Sum together the storage, process, and waste quantities to calculate the maximum amount of the toxic chemical on-site at any one point during the year. (3.00 min/3.00 min)

- Locate the appropriate 2-digit code from the TRI Reporting Forms and Instructions and report it in Part II, Section 4.1 of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part II, Section 4.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.08	0.91
Technical	30.25	30.25
Total	31.33	31.16

Section 5.1: Fugitive or Non-Point Air Emissions

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.08 min/2.58 min)

The most commonly reported basis of estimate code for fugitive air releases for both non-PBT and PBT chemicals is "O," other approaches. It is assumed the most typical approach would involve an estimate based on use of physical and chemical properties and process operating conditions. To estimate fugitive or non-point air emissions, technical staff would perform the following steps:

- Identify all fugitive release points for the chemical through review of air permits, discussions with operations staff, review of process flow diagrams, or a visual inspection of operations. (30.00 min/5.00 min)

- Identify physical and chemical property data for the chemical, including volatility, boiling point, etc. (5.00 min/5.00 min)

- Identify relevant process operating conditions, such as temperature, turbulence, etc., (45.00 min/30.00 min)

- Determine material usage quantity through a review of inventory records, purchase records, operation records, or discussions with operations staff. (30.00 min/30.00 min)

- Locate and review guidance from EPA, trade associations, or other sources, or air permit information that provides quantitative assistance for estimating fugitive loss (e.g., EPA's Protocol for Equipment Leak Emission Estimates, air permit assumption of 1% loss of volatiles due to transfers in an otherwise closed system). (60.00 min/30.00 min)

- Make the best estimate of fugitive or non-point air emissions based upon the physical and chemical properties and process operating conditions and report the value in Part II, Section 5.1 of the Form R. (25.00 min/15.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.1.B of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part II, Section 5.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.08	2.58
Technical	195.25	115.08
Total	198.33	117.66

Section 5.2: Stack or Point Air Emissions

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.08 min/1.75 min)

The most commonly reported basis of estimate code for stack air releases for non-PBT chemicals is "O," other approaches. It is assumed the most typical approach uses non-published emission factors. The most commonly reported basis of estimate code for stack air releases for PBT chemicals is "E," published emission factors. Using these emission factors, technical staff would perform the following steps:

- Identify all of the stack release points for the chemical. The process for identifying these releases requires technical staff to perform any or all of the following steps: review air permits or process flow diagrams, consult with operational/environmental staff, or conduct a visual inspection of the facility. (30.00 min/5.00 min)

- For each stack air release, locate the most applicable emission factor. For PBT chemicals, EPA-published emission factors are obtained from numerous EPA sources, including a chemical or industry specific guidance, AP-42, or the technology transfer

network (for TANKS program). (10/9 minutes) For non-PBT chemicals, emission factors are obtained from sources such as trade associations and university research. (30.00 min/15.00 min)

- Determine the annual quantity of input material by reviewing purchase records, inventory records, and/or operational records. (30.00 min/30.00 min)

- Multiply this material usage quantity by the emission factor to determine the amount of material released from each point during the year. If needed, convert the amount of material released to pounds (or grams for dioxins) by applying the appropriate conversion factor. (6.00 min/6.00 min)

It is assumed that there will be an average of two unique types of stack releases for each chemical at a typical facility (i.e., two different emission factors would be applied). There are economies of scale in quantifying the second release type due to concurrent activities, such as searching the same sources to locate emission and conversion factors (4.00 min/4.00 min) and reviewing the same sources to determine the annual quantity of input material. Technical staff would perform the following steps:

- Multiply this material usage quantity by the emission factor to determine the amount of material released from each point during the year. If needed, convert the amount of material released to pounds (or grams for dioxins) by applying the appropriate conversion factor. (5.00 min/5.00 min)

- Sum all of the quantified stack air releases for the given chemical to quantify the total stack or point air emissions (lb/yr) and report the value in Part II, Section 5.2 of the Form R. (1.00 min/1.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.2.B of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part II, Section 5.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.08	1.75
Technical	106.25	66.25
Total	109.33	68.00

Appendix G
Section 5.3: Discharges to Receiving Streams or Water Bodies

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.33 min/2.83 min)

The most commonly reported basis of estimate code for discharges to receiving streams or water bodies is "M," use of monitoring data, for both non-PBTs and PBTs. To estimate discharges to receiving streams or water bodies, technical staff would perform the following steps:

Release Quantity from Process Water

1. Locate and review the facility's monitoring results for process water outfall(s) to determine the chemical concentration for each monitoring point. (35.00 min/25.00 min)

2. Obtain flow rate data from the NPDES permit or a flow meter. If neither is available, estimate the volume of wastewater generated by reviewing water usage data. The estimated flow is calculated by dividing the volume of wastewater by the usage time (e.g., days). (15.00 min/10.00 min)

3. Identify the number of discharge days by talking with operations staff. (15.00 min/15.00 min)

4. Multiply the identified chemical concentration (for one monitoring data point) by the daily water flow rate to calculate the daily release for this point. Repeat this step for all monitoring points, averaging the results together to calculate the average daily release. Multiply the average daily release by the number of release days to calculate the total annual release quantity. Apply any needed conversion factors to get the result in pounds. (10.00 min/10.00 min)

Release Quantity from Storm Water

5. Locate and review the facility's monitoring results from storm water outfall(s) to determine the chemical concentration for each monitoring point, and average them together. Apply needed conversion factors to obtain the total annual release from storm water in pounds. (45.00 min/35.00 min)

6. Locate the annual rainfall for the facility's area, assuming 12 inches of snow is equivalent to 1 inch of rain. (4.00 min/3.00 min)

7. Estimate the percent of land at the facility covered by asphalt, concrete, and unimproved vegetation/soil. Technical staff generate a weighted-average runoff coefficient by multiplying the percent of land area by the runoff coefficient for that land type. (30.00 min/5.00 min)

8. Multiply the total annual rainfall by the weighted-average runoff coefficient, the total area of the facility, and the conversion factor for gallons per cubic foot to calculate the total annual storm water runoff in gallons. (5.00 min/5.00 min)

9. Multiply the total volume (gallons) of storm water by the chemical concentration to calculate the total mass (pounds) of the chemical contained in the annual storm water runoff. If needed, apply a conversion factor. (4.00 min/4.00 min)

Total Release Quantity

10. Sum together the annual release quantity from process water with the annual release quantity from storm water to obtain the total annual release quantity to water. Report the total release (lb/yr) in Part II, Section 5.3.1.A of the Form R as the total releases to a water body for a specific chemical. (2.00 min/2.00 min)

Basis of Estimate

11. Report whether the release estimate was based on monitoring data, mass balance, a published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.3.1.B of the Form R. (0.25 min/0.25 min)

Percent from Stormwater

12. Divide the quantity of the chemical contained in the storm water by the total quantity of the chemical released to water in order to calculate the percent of the chemical released from storm water. Report this percentage in Part II, Section 5.3.1.C of the Form R. (2.00 min/2.00 min)

Note: Many facilities will not need to assess storm water in order to calculate release to water as many TRI chemicals will not typically be found in storm water run-off, but will instead only be found in process water. In order to reasonably estimate how much time should be allocated to a typical facility for assessing storm water, a data analysis was conducted on the RY 2002 TRI data. First, all form Rs for which 5.3A had a value of greater than or equal to zero were identified. Second, within that set, the percentage of these forms that had a value of greater than zero in 5.3C were identified. This analysis was conducted separately for non-PBTs and for PBTs, with identified values of 39.3% and 44.4%, respectively. The total estimated burden for identifying annual release quantity from storm water (steps 5 through 9 above) was then multiplied by 39.3% for non-PBTs and by 44.4% for PBTs. This calculation is shown below:

Total percent from storm water burden multiplied by incidence rate for a value greater than zero in 5.3.C when there was a value of greater than or equal to zero in 5.3.A:

non-PBTs: (88.00 min/52.00 min) x 39.3% incidence = (34.58/20.44)
PBTs: (88.00 min/52.00 min) x 44.4% incidence = (39.07/23.09)

This incidence-weighted value was added with the total estimated burden for identifying the annual release quantity from process water to obtain the total calculation time estimate for 5.3.A. The table below reflects the incidence-weighted value for storm water assessment.

Reporting Burden Associated with Part II, Section 5.3

Personnel Type	First Year Burden (minutes)		Subsequent Year Burden (minutes)	
	Non-PBT	PBT	Non-PBT	PBT
Management	3.33	3.33	2.83	2.83
Technical	113.83	118.32	84.69	87.34
Total	117.16	121.65	87.52	90.17

Section 5.4.1: Underground Injection On-Site to Class I Wells

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (2.08 min/1.75 min)

The most commonly reported basis of estimate code for releases to underground injection Class I wells is "M," use of monitoring data for both non-PBT and PBT chemicals. To estimate quantities injected underground or on-site to Class I wells, the technical staff would perform the following steps:

1. Locate and review monitoring data for the facility, and then, for each monitoring event, identify the concentration of the specific chemical in the waste stream. The chemical concentrations from all monitoring events are then averaged. (35.00 min/25.00 min)

2. Either talk to operations staff, review production records and estimate waste generation, review well operations records, or review well permit data/required injection well reports to determine the total quantity of waste disposed via Class I wells for the reporting year. (30.00 min/30.00 min)

3. Multiply the total quantity of waste disposed via Class I wells by the average concentration of the specific chemical in the waste stream to calculate the total pounds of the chemical released to Class I wells during the reporting year. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.4.1.A of the Form R. (8.00 min/8.00 min)

4. Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.4.1.B of the Form R. (0.25 min/0.25 min)

Appendix G
Reporting Burden Associated with Part II, Section 5.4.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	2.08	1.75
Technical	73.25	63.25
Total	75.33	65.00

Section 5.4.2: Underground Injection On-Site to Class II-V Wells

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (2.08 min/1.75 min)

The most commonly reported basis of estimate code for releases to underground injection Class II-V wells is "M," use of monitoring data for both non-PBT and PBT chemicals. To estimate quantities injected underground or on-site to Class II-V wells, the technical staff would perform the following steps:

1. Locate and review monitoring data for the facility. Then, for each monitoring point, identify the concentration of the specific chemical in the waste stream. The chemical concentrations from all monitoring data points (events) are then averaged. (35.00 min/25.00 min)

2. Either talk to the operations staff, review production records and estimate waste generation, review well operations records, or review well permit data/required injection well reports to determine the total quantity of waste disposed via Class II-V wells for the reporting year. (30.00 min/30.00 min)

3. Multiply the total quantity of waste disposed via Class II-V wells by the average concentration of the specific chemical in the waste stream to calculate the total pounds of the chemical released to Class II-V wells during the reporting year,. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.4.2.A of the Form R. (8.00 min/8.00 min)

4. Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.4.2.B of the Form R. (0.25 min/0.25 min)

Appendix G

Reporting Burden Associated with Part II, Section 5.4.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	2.08	1.75
Technical	73.25	63.25
Total	75.33	65.00

Section 5.5.1A: On-site Land Disposal via RCRA Subtitle C Landfills

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.08 min/1.75 min)

The most commonly reported basis of estimate code for releases to RCRA landfills is "O," other approaches, for both non-PBT and PBT chemicals. It is assumed technical staff would track the generation and on-site disposal of these wastes as follows:

1. Identify all waste streams containing the chemical of interest disposed of in RCRA landfills. (30.00 min/5.00 min)

2. Review RCRA records (manifests and biennial reports) to determine the total quantity of waste disposed of in RCRA landfills for the reporting year; or talk to operations staff, review production records and estimate waste generation, or review on-site disposal tracking records. (30.00 min/30.00 min)

3. Review RCRA waste characterization data, talk to operations staff, review any non-RCRA waste characterization information, or review production/activity Standard Operating Procedures (SOPs) and process flow diagrams to determine the concentration of a specific chemical disposed of in a RCRA landfill. (30.00 min/25.00 min)

4. Multiply the total quantity of waste disposed of in RCRA landfills by the average concentration of the specific chemical in the waste stream to calculate the total pounds of the chemical disposed of in RCRA landfills during the reporting year,. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.5.1A.A of the Form R. (6.00 min/6.00 min)
5. Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.1A.B of the Form R. (0.25 min/0.25 min)

Appendix G
Reporting Burden Associated with Part II, Section 5.5.1A

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.08	1.75
Technical	96.25	66.25
Total	99.33	68.00

Section 5.5.1B: On-site Land Disposal via Other Landfills
Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.08 min/1.75 min)

The most commonly reported basis of estimate code for releases to on-site non-RCRA landfills is "O," other approaches, for both non-PBT and PBT chemicals. It is assumed the technical staff would track the generation and on-site disposal of these wastes as follows:

1. Identify all waste streams containing the chemical of interest disposed of in on-site non-RCRA landfills. (30.00 min/5.00 min)

2. Talk to operations staff, review production records and estimate waste generation, or review on-site disposal tracking records to determine the total quantity of waste disposed of in non-RCRA landfills for the reporting year. (30.00 min/30.00 min)

3. Talk to operations staff, review any waste characterization information, or review production/activity SOPs and process flow diagrams to determine the concentration of a specific chemical disposed of in non-RCRA landfills. (30.00 min/25.00 min)

4. Multiply the total quantity of waste disposed via non-RCRA landfills by the average concentration of the specific chemical in the waste stream to calculate the total pounds of the chemical disposed of in non-RCRA landfills during the reporting year. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.5.1B.A of the Form R. (6.00 min/6.00 min)

5. Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.1B.B of the Form R. (0.25 min/0.25 min)

Appendix G
Reporting Burden Associated with Part II, Section 5.5.1B

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.08	1.75
Technical	96.25	66.25
Total	99.33	68.00

Section 5.5.2: On-Site Land Disposal via Land Treatment/Application Farming

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (2.08 min/1.75 min for non-PBT filers; 3.08 min/1.75 min for PBT filers)

The most commonly reported basis of estimate code for releases via land treatment is "M," use of monitoring data, for non-PBT chemicals. To estimate the quantity going to on-site land disposal via land treatment/application farming for non-PBT chemicals, the technical staff would perform the following steps:

1. Locate monitoring data and determine the chemical concentration in the waste stream for each monitoring point. Then calculate an average chemical concentrations across all monitoring data points (events). (35.00 min/ 25.00 min)

2. Talk to operations staff, review production records, and estimate waste generation, or review on-site disposal tracking records (i.e., the number of land applications multiplied by the average load size) to determine the total quantity of waste disposed via land treatment/application farming for the reporting year. (30.00 min/30.00 min)

3. Multiply the total quantity of waste disposed via land treatment by the average concentration of the specific chemical in the waste stream to calculate the total pounds of the chemical disposed of on-site for land treatment/application farming during the reporting year. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.5.2.A of the Form R. (8 min/8 min)

4. Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.2.B of the Form R. (0.25 min/0.25 min)

The most commonly reported basis of estimate code for releases via land treatment is "O," other approaches, for PBT chemicals. To estimate the quantity going to on-site land disposal via land treatment/application farming for PBT chemicals, the technical staff would perform the following steps:

- Identify all waste streams disposed of via land treatment that contain the chemical of interest. (30.00 min/5.00 min)

- Determining the total quantity of waste disposed of via land treatment for the reporting year requires the technical staff to either talk to operations staff, review production records and estimate waste generation, or review on-site disposal tracking records. (30.00 min/30.00 min)

- Talk to operations staff, review any waste characterization information, or review production/activity SOPs and process flow diagrams to generate chemical concentration estimates of a specific chemical disposed of via land treatment. (30.00 min/25.00 min)

- Multiply the total quantity of waste disposed via land treatment by the average concentration of the specific chemical in the waste stream to calculate the total pounds of the chemical disposed of via land treatment during the reporting year. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.5.2.A of the Form R. (6.00 min/6.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.2.B of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part II, Section 5.5.2

Personnel Type	First Year Burden (minutes)		Subsequent Year Burden (minutes)	
	Non-PBT	PBT	Non-PBT	PBT
Management	2.08	3.08	1.75	1.75
Technical	73.25	96.25	63.25	66.25
Total	75.33	99.33	65.00	68.00

Section 5.5.3A: RCRA Subtitle C Surface Impoundments

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.08 min/1.75 min)

The most commonly reported basis of estimate code for releases via RCRA surface impoundments is "C," mass balance, for both non-PBT and PBT chemicals. To estimate TRI chemical quantities sent to RCRA landfills, technical staff would track the loss of this chemical using a mass balance approach as follows:

- Identify all waste streams disposed of via RCRA Subtitle C surface impoundments that contain the chemical of interest. (30.00 min/5.00 min)

- Determine the total annual chemical usage quantity through a review of production records, a review of inventory records, or conversations with operations staff. (30.00 min/30.00 min)

- Estimate the quantity of the chemical that goes out with the product through a review of product QA/QC data or product specifications, or conversations with operations staff. (30.00 min/25.00 min)

- Subtract the quantity of the chemical in the product from the total chemical usage quantity to determine the total waste quantity via mass balance. If the total waste quantity is not disposed of via RCRA surface impoundment, the total waste quantity is multiplied by the percentage of waste going to RCRA surface impoundments. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.5.3A.A of the Form R. (6.00 min/6.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.3A.B of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part II, Section 5.5.3A

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.08	1.75
Technical	96.25	66.25
Total	99.33	68.00

Section 5.5.3B: Other Surface Impoundments

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.08 min/1.75 min)

The most commonly reported basis of estimate code for releases via other surface impoundments is "C," mass balance, for both non-PBT and PBT chemicals. To estimate TRI chemical quantities sent to other surface impoundments, technical staff would track the loss of this chemical using a mass balance approach as follows:

- Identify all waste streams disposed of via other surface impoundments that contain the chemical of interest through a review of process flow diagrams, conversations with operations staff, or a visual inspection of the process area. (30.00 min/5.00 min)

- Determine the total annual chemical usage quantity through a review of production records, a review of inventory records, or conversations with operations staff. (30.00 min/30.00 min)

- Estimate the quantity of chemical that goes out with the product through a review of product QA/QC data or product specifications, or conversations with operations staff. (30.00 min/25.00 min)

- Subtract the quantity of the chemical in the product from the total chemical usage quantity to determine the total waste quantity via mass balance. If the total waste quantity is not disposed of via non-RCRA surface impoundment, the total waste quantity is multiplied by the percentage of waste going to non-RCRA surface impoundments. If needed, apply a conversion factor. Report the value (lb/yr) in Part II, Section 5.5.3B.A of the Form R. (6.00 min/6.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.3B.B of the Form R. (0.25 min/0.25 min)

Reporting Burden Associated with Part II, Section 5.5.3B

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.08	1.75
Technical	96.25	66.25
Total	99.33	68.00

Section 5.5.4: Other On-Site Land Disposal

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.08 min/0.91 min)

Other on-site land disposal can include intentional storage of wastes on land (other than in landfills, surface impounds or via land treatment/application farming), or unplanned releases to land from spills and accidents. Best engineering judgement indicates that reporting in this category is primarily due to unplanned releases from spills and accidents. While time estimates are provided for both scenarios, the time allotted to this data element for the overall Form R realistic burden estimate is from the unplanned release scenario only.

The most commonly reported basis of estimate code for other on-site land disposal is “O,” other approaches, for both non-PBT and PBT chemicals. It is assumed that the approach used by technical staff would be to track the generation and on-site disposal of these wastes as follows:

For planned other on-site disposal to land:

- Identify all waste streams disposed of via other land disposal that contain the chemical of interest. (30.00 min/5.00 min)

- Talk to operations staff, review production records and estimate waste generation, or review on-site disposal tracking records to determine the total quantity of waste disposed of via other land disposal for the reporting year. (30.00 min/30.00 min)

- Talk to operations staff, review any waste characterization information, or review production/activity SOPs and process flow diagrams to generate chemical concentration estimates of a specific chemical disposed of via other land disposal. (30.00 min/25.00 min)

- For planned releases, multiply the total quantity of waste disposed via surface impoundment by the average concentration of the specific chemical in the waste stream to calculate the total release pounds of the chemical disposed of via other land disposal during the reporting year. If needed, apply a conversion factor. (6.00 min/6.00 min)

For unplanned other on-site disposal to land:

- For unplanned releases, determine the total quantity of the chemical released to land during unplanned events, such as spills and accidents, by either reviewing spill reports, contacting spill responders, or conducting a mass balance estimate based upon the quantity of materials in storage tanks before and after the event. Report the value (lb/yr) in Part II, Section 5.5.4.A of the Form R. (35.00 min/35.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 5.5.4.B of the Form R. (0.25 min/0.25 min)

Best engineering judgment indicates that most reporting in this section will come from unplanned (accidental) releases. As such, the following table only provides time estimates relevant to the reporting of these releases.

Reporting Burden Associated with Part II, Section 5.5.4

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.08	0.91
Technical	35.25	35.25
Total	36.33	36.16

Appendix G
Section 6.1: Discharges to Publicly Owned Treatment Works

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (3.58 min/2.25 min)

The most commonly reported basis of estimate code for discharges to POTWs is "M," use of monitoring data, for both non-PBTs and PBTs. To estimate the total quantity of a TRI chemical discharged to a POTW, technical staff would perform the following steps:

- Locate and review monitoring data in order to identify the necessary chemical concentration information. The monitoring data could be obtained by either reviewing internal files or speaking directly with the pre-treatment coordinator at the POTW. (35.00 min/25.00 min)

- Review flow meter data to locate flow rate data. If flow meter data are not available, technical staff estimate the quantity of wastewater generated by reviewing water usage data. This quantity is then divided by usage time (e.g., days) in order to calculate the estimated flow. Alternatively, technical staff might request flow rate data directly from the POTW. (15.00 min/10.00 min)

- Talk with operations staff or contact the POTW to determine the number of days wastewater was sent to the POTW. (15.00 min/15.00 min)

- Multiply the identified chemical concentration (for one monitoring data point) by the daily water flow rate to calculate the total mass of the chemical transferred to the POTW on a daily basis. If needed, locate a conversion factor in order to report the final result in units of pounds per day. Repeat the above steps for every monitoring result, then average together all of the results. Multiply the pound per day release value by the total number of discharge days per year to calculate the total annual transfers to POTWs in pounds. Report the value (lb/yr) in Part II, Section 6.1.A.1 of the Form R. (8.00 min/8.00 min)

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Part II, Section 6.1.A.2 of the Form R. (0.25 min/0.25 min)

An analysis of the RY 2002 showed that an average of one POTW per Form R was listed for both non-PBT and PBT chemicals. For subsequent year reporting, it is assumed the facility will be using the same POTW.

- Technical staff will have the POTW name and location information readily available from document review conducted for the release estimate. Technical staff will report this information in Part II, Section 6.1.B.1 of the Form R. (1.50 min/0 min)

Appendix G
Reporting Burden Associated with Part II, Section 6.1

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	3.58	2.25
Technical	74.75	58.25
Total	78.33	60.50

Section 6.2: Transfers to Other Off-Site Locations

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (4.83 min/3.42 min)

The most commonly reported basis of estimate code for transfers to other off-site locations is "O," other approaches, for both non-PBT and PBT chemicals. It is assumed that the approach used by technical staff would be to track the off-site transfer of these wastes primarily using waste characterization and waste transfer documentation as outlined below:

- Identify all off-site transfers of unique waste streams containing the chemical of interest. (30.00 min/ 5.00 min)

- For the first unique waste stream, determine the concentration of the chemical in the stream by either reviewing waste characterization profiles, contacting the facility's hazardous waste shipper to obtain their waste characterization information, or conducting a mass balance evaluation. (30.00 min/30.00 min)

- Determine the total quantity of the first unique waste stream that the facility ships off-site during the reporting year by reviewing hazardous waste manifests, invoices from waste vendors, or talking to operations staff. (30.00 min/30.00 min)

- For the first waste stream, multiply the chemical concentration by the total quantity of waste shipped off-site to calculate the total quantity of the chemical shipped off-site for the year. If needed, multiply by a conversion factor to obtain a final result in pounds. (6.00 min/6.00 min)

An analysis of RY 2002 TRI data indicates that there was an average of approximately two off-site transfer locations and an average of approximately two reported "M" codes. Therefore, it is assumed that on average, two unique waste streams are being transferred off-site. There are economies of scale in estimating the quantity of the TRI chemical in the second waste stream due to the concurrent activities of reviewing the same sources to determine the chemical concentration in the waste and to estimate the annual quantity of waste transferred off-site. To estimate the additional time needed to quantify the off-site transfer of the second waste stream technical staff would perform the following:

- For the second waste stream, determine the concentration of the chemical in the stream by either reviewing waste characterization profiles, contacting the facility's hazardous waste shipper to obtain their waste characterization information, or conducting a mass balance evaluation. Determine the total quantity of each unique waste stream that the facility ships off-site during the reporting year. (5.00 min/5.00 min)

- For the second waste stream, multiply the chemical concentration by the total quantity of waste shipped off-site to calculate the total quantity of the chemical shipped off-site for the year. If needed, multiply by a conversion factor to obtain a final result in pounds. Calculate the total quantity of the chemical shipped off-site for all waste streams by summing together the annual quantity of the chemical shipped off-site in each waste stream. Report this result (lb/yr) in Part II, Section 6.2.A of the Form R. (6.00 min/6.00 min)

For both waste streams, technical staff would perform the following steps:

- Report whether the release estimate was based on monitoring data, mass balance, published emission factor, or other engineering calculations by recording the code M, C, E, or O, respectively, in Section 6.2.B of the Form R. (0.25 min/0.25 min)

- Report the type of waste treatment/disposal/recycling/energy recovery code by recording the appropriate M-code in Section 6.2.C of the Form R. (0.25 min/0.25 min)

As indicated above, an analysis of RY 2002 TRI data showed that for off-site transfers, there was an average of approximately two off-site transfer locations. For subsequent year reporting, it is assumed the facility will not necessarily use the same off-site transfer locations. Due to the competitive nature of the hazardous waste removal industry, market fluctuations, the search for better pricing, and the fact that facilities can readily change vendors (unlike piping changes needed to use a different POTW, for example), it is possible that facilities may be using different off-site transfer locations from year-to-year. For this reason, it is not assumed that only one off-site transfer facility name and location will be pre-populated from loading last year's forms, and typing time is allotted to enter the second off-site transfer name and location information.

- Technical staff will have the off-site transfer name and location information readily available from document review conducted for the release estimate and will report this information in Part II, Section 6.2.1 and 6.2.2 of the Form R. (4.17 min/2.08 min)

Appendix G
Reporting Burden Associated with Part II, Section 6.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	4.83	3.42
Technical	112.17	84.58
Total	117.00	88.00

Section 7A: On-Site Waste Treatment Methods and Efficiency

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (5.17 min/3.50min)

To complete Section 7A, technical staff perform the following steps:

- Review process diagrams, review air or NPDES permits, or talk to the operations staff to identify any on-site waste treatment activities. For the first waste stream, technical staff perform the following steps:
    - Identify the type of waste stream (gaseous, wastewater, liquid waste, or solid waste) and report the appropriate code in Part II, Section 7A.1a. (10.00 min/5.00 min)
    - Identify all of the treatment steps this waste stream passes through and the order of occurrence. Locate the appropriate treatment codes representing the treatment activity in the TRI Reporting Forms and Instructions and report them in the actual order of occurrence in Part II, Section 7A.1b of the Form R. (20.00 min/5.00 min)
- Locate and review monitoring data, or talk with operations staff to determine the range of influent concentration. Report the appropriate range code for this concentration in Part II, Section 7A.1.c of the Form R. (30.00 min/15.00 min)
- Technical staff apply one of the approaches listed below to quantify the treatment efficiency:
    - Review equipment manuals for manufacturer reported efficiencies.
    - Use pre- and post-treatment analytical data to calculate treatment efficiency by subtracting the post-treatment chemical concentration from the pre-treatment chemical concentration and then divide the result by the pre-treatment chemical concentration.
    - Technical staff can also obtain the information by talking to operations staff.

- Report the treatment efficiency in Part II, Section 7A.1.d of the Form R (15.00 min/5.00 min).

- Report whether the efficiency was calculated using monitoring data by checking yes or no in Part II, Section 7A.1e of the Form R. (0.08 min/0.08 min)

An analysis of RY 2002 TRI data indicates that there was an average of approximately two waste streams listed under on-site treatment in Section 7A. The additional steps technical staff would take in identifying and reporting on-site treatment activities are outlined below. There are some economies of scale in identifying on-site treatment activities for the second waste stream as a full facility operations review was conducted as part of identifying if there are any waste streams undergoing on-site treatment.

- No additional time would be needed to identify types of waste streams undergoing on-site treatment as the necessary review was already conducted to identify the first waste stream. Therefore, no additional time is needed in Part II, Section 7A.2a for the second waste stream (0.00min/0.00min).

- Only incremental additional time would be needed to identify waste treatment activity steps for the second waste stream as document review and discussions with operations staff were already conducted to identify steps for the first waste stream. Therefore, the following additional time is needed in Part II, Section 7A.2b for the second waste stream (5.00min/2.00min).

- Determining the range of the influent concentration for the second waste stream would require the same time effort as for the first waste stream because technical staff would be reviewing a different set of information, such as different laboratory reports. Therefore, the following additional time is needed in Part II, Section 7A.2c for the second waste stream (30.00min/15.00min).

- Determining the treatment efficiency for the second waste stream would require the same time effort as for the first waste stream because technical staff would be reviewing a different set of information, such as different equipment manuals. Therefore, the following additional time is needed in Part II, Section 7A.2d for the second waste stream (15.00min/5.00min).

- Report whether the efficiency for the second waste stream was calculated using monitoring data by checking yes or no in Part II, Section 7A.2e of the Form R,. (0.08 min/0.08 min)

Appendix G
Reporting Burden Associated with Part II, Section 7A

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	5.17	3.50
Technical	125.16	52.16
Total	130.33	55.66

Section 7B: On-Site Energy Recovery Processes

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.0 min/0.83 min)

It is assumed that technical staff either review process flow diagrams or talk to operations staff in order to identify any on-site energy recovery activities. For each waste stream that is undergoing treatment for on-site energy recovery, technical staff locate the appropriate code for the activity in the TRI Reporting Forms and Instructions. The codes are reported in descending order by quantity of energy recycled in Part II, Section 7B of the Form R. (32.00 min/24.00 min)

Reporting Burden Associated with Part II, Section 7B

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.00	0.83
Technical	32.00	24.00
Total	33.00	24.83

Section 7C: On-Site Recycling Processes

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.0 min/0.83 min)

It is assumed that technical staff either review process flow diagrams or talk to operations staff in order to identify any on-site recycling activities. For each waste stream that is undergoing treatment for on-site recycling, technical staff locate the appropriate code for the activity in the TRI Reporting Forms and Instructions. The codes are reported in descending order by quantity of waste recycled in Part II, Section 7C of the Form R. (38.00 min/27.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 7C

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.00	0.83
Technical	38.00	27.00
Total	39.00	27.83

Section 8.1a: Total On-Site Disposal to Class I Underground Injection Wells, RCRA Subtitle C Landfills, and Other Landfills

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.1a, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.1a, Column A of the Form R. (0.25 min/0.25 min)

- Column B: Sum together the quantities calculated in Part II, Sections 5.4.1, 5.5.1A, and 5.5.1B and then subtract any on-site release or disposal quantities due to catastrophic events. Report the total quantity disposed of on-site via Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills in Part II, Section 8.1a, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.1a, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.1a, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Reporting Burden Associated with Part II, Section 8.1a

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.50	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.1b: Total Other On-Site Disposal or Other Releases

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.1b, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.1b, Column A of the Form R. (0.25 min/0.25 min)

- Column B: Sum together the quantities calculated in Part II, Sections 5.1, 5.2, 5.3, 5.4.2, 5.5.2, 5.5.3A, 5.5.3B, and 5.5.4 and then subtract any on-site release or disposal quantities due to catastrophic events. Report the total quantity disposed of on-site via other disposal or other releases in Part II, Section 8.1b, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.1b, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.1b, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.1b

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.5	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.1c: Total Off-Site Disposal to Class I Underground Injection Wells, RCRA Subtitle C Landfills, and Other Landfills

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.1c, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.1c, Column A of the Form R. (0.25 min/0.25 min)

- Column B: Sum together the quantities calculated in Part II, Sections 6.1 (portion of transfer that is untreated and ultimately disposed of in UIC Class I Wells, RCRA Subtitle C landfills and other landfills) and 6.2 (quantities associated with M codes M64, M65, and M81) and then subtract any off-site disposal quantities due to catastrophic events. Report the total quantity disposed of off-site via Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills in Part II, Section 8.1c, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.1c, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.1c, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G

Reporting Burden Associated with Part II, Section 8.1c

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.5	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.1d: Total Other Off-Site Disposal or Other Releases

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.1d, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.1d, Column A of the Form R. (0.25 min/0.25 min)

- Column B: Sum together the quantities calculated in Part II, Sections 6.1 (portion of transfer that is untreated and ultimately disposed of in UIC Class II-V Wells, and land disposal other than to landfills) and 6.2 (quantities associated with M codes M10, M41, M62, M66, M67, M73, M79, M82, M90, M94, and M99) and then subtract any off-site disposal quantities due to catastrophic events. Report the total quantity disposed of off-site via other disposal or other releases in Part II, Section 8.1d, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.1d, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.1d, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G

Reporting Burden Associated with Part II, Section 8.1d

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.50	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.2: Quantity Used for Energy Recovery On-Site

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.25 min/1.08 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.2, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.2, Column A of the Form R. (0.25 min/0.25 min)

- Column B: To estimate the quantity of the chemical used annually for actual energy recovery on-site, refer to the recovery processes reported in Section 7B and either review operations records or speak with operations staff. Report the total quantity used for energy recovery on-site in Part II, Section 8.2, Column B of the Form R. (30.00 min/30.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.2, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.2, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.2

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.25	1.08
Technical	32.25	32.25
Total	33.50	33.33

Section 8.3: Quantity Used for Energy Recovery Off-Site

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading of this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.3, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.3, Column A of the Form R. (0.25 min/0.25 min)

- Column B: To estimate the quantity of the chemical used annually for energy recovery off-site, subtract Section 8.8 (off-site energy recovery due to catastrophic events) from Section 6.2 (quantities associated with energy recovery) and report the value in Part II, Section 8.3, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.3, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.3, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.3

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.5	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.4: Quantity Recycled On-Site

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.25 min/1.08 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.4, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.4, Column A of the Form R. (0.25 min/0.25 min)

- Column B: Estimate the quantity of the chemical actually recycled on-site annually by reviewing the information identified for Section 7C and either review operations records or speak with operations staff. Report the total quantity recycled on-site in Part II, Section 8.4, Column B of the Form R. (30.00 min/30.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.4, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.4, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.4

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.25	1.08
Technical	32.25	32.25
Total	33.50	33.33

Section 8.5: Quantity Recycled Off-Site

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.5, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.5, Column A of the Form R. (0.25 min/0.25 min)

- Column B: To estimate the quantity of the chemical recycled annually off-site, subtract Section 8.8 (off-site recycling due to catastrophic events) from Section 6.2 (quantities associated with recycling) and report the value in Part II, Section 8.5, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.5, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.5, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.5

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.5	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.6: Quantity Treated On-Site

Management burden includes review of data, methods, and assumptions used to develop the estimate. In some cases it also includes data quality activities such as comparing the values with previous years. (1.25 min/1.08 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.6, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.6, Column A of the Form R. (0.25 min/0.25 min)

- Column B: Estimate the quantity of the chemical actually treated on-site annually by reviewing the information identified for Section 7A and either review operations records or speak with operations staff. The total quantity treated on-site is reported in Part II, Section 8.6, Column B of the Form R. (30.00 min/30.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.6, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.6, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.6

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.25	1.08
Technical	32.25	32.25
Total	33.50	33.33

Section 8.7: Quantity Treated Off-Site

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.50 min/0.50 min)

Four columns must be completed in this section, requiring technical staff to perform the following steps:

- Column A: Record "NA" in Part II, Section 8.7, Column A of the Form R if the facility is a first time filer. For subsequent reporting years, locate the release estimate from the "Column B, Current Reporting Year" column from the previous year's form and record this quantity in Part II, Section 8.7, Column A of the Form R. (0.25 min/0.25 min)

- Column B: To estimate the quantity of the chemical treated off-site, sum together the quantities from Section 6.1 (excluding most metal/metal category compounds) and Section 6.2 (the quantities associated with treatment) and then subtract any portion of Section 8.8 associated with off-site treatment due to catastrophic events. Report the total quantity treated off-site in Part II, Section 8.7, Column B of the Form R. (5.00 min/5.00 min)

- Column C: Make the best projection for the following year's release quantity and record it in Part II, Section 8.7, Column C of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the following year. If source reduction activities are planned, make the best estimate for how much this will reduce the release quantity for the following year. (1.00 min/1.00 min)

- Column D: Make the best projection for the second following year's release quantity and record it in Part II, Section 8.7, Column D of the Form R. If no source reduction activities are planned, multiply the current year release estimate by the expected percentage change in production for the second following year. If source reduction activities are planned, make the best estimate of how much this will reduce the release quantity for the second following year. (1.00 min/1.00 min)

Appendix G
Reporting Burden Associated with Part II, Section 8.7

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.50	0.50
Technical	7.25	7.25
Total	7.75	7.75

Section 8.8: Quantity released to the Environment as a Result of Remedial Actions, Catastrophic Events, or One-Time Events not Associated with Production Processes

Management burden includes an assessment of whether quantities previously calculated for Sections 5 and 6 have been recorded in the correct subsection of Section 8 as well as proofreading this section as part of an overall review of the Form R. (0.25 min/0.25 min)

Technical staff sum together the relevant quantities already estimated and record them in Part II, Section 8.8, Column B of the Form R. (5.00 min/5.00 min)

Reporting Burden Associated with Part II, Section 8.8

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.25	0.25
Technical	5.00	5.00
Total	5.25	5.25

Section 8.9: Production Ratio or Activity Index

Management burden includes review of data, methods, and assumptions used to develop the production ratio; and in some cases, data quality activities such as comparing the values with previous years. (0.83 min/0.83 min)

Technical staff would perform the following steps to calculate the production ratio or activity index:

- Determine the annual production or activity level for the reporting year by either reviewing production records or maintenance logs, or talking with the operations staff. (30.00 min/30.00 min)

- Determine the annual production or activity level for the previous year by reviewing maintenance records or talking with operations staff. (5.00 min/5.00 min)

- Divide the current year's production or activity level by the prior year's production or activity level. Alternatively, review the waste minimization section of the RCRA report.

Report the production ratio or activity index in Part II, Section 8.9 of the Form R. (1.00 min/1.00 min)

For facilities reporting for the first year, a production ratio is required if the facility manufactured, processed or otherwise used the TRI chemical in the previous year, even if no thresholds were exceeded. While some first year reports will be for completely new operations, others will be for facilities that have exceeded threshold for the first time. For this reason, it was assumed that calculation of the production ratio would be required for first year reports.

Reporting Burden Associated with Part II, Section 8.9

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0.83	0.83
Technical	36.00	36.00
Total	36.83	36.83

Section 8.10: Did Your Facility Engage in any Source Reduction Activities?

Management burden includes review of data and methods used to identify source reduction activities. (1.08 min/0.92 min)

To identify whether or not any source reduction activities were implemented, technical staff either review SOPs; review any process, equipment, or material input changes; review the waste minimization section of the RCRA report; or talk with operations staff. If source reduction activities were implemented, technical staff locate the source reduction codes in the Reporting Forms and Instructions and enter the codes in Section 8.10.1 of the Form R. Technical staff enter the appropriate codes for Methods to Identify Activity in Section 8.10.1.a. (35.25 min/35.25 min)

Reporting Burden Associated with Part II, Section 8.10

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	1.08	0.92
Technical	35.25	35.25
Total	36.33	36.17

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Section 8.11: Is Additional Information on Source Reduction, Recycling or Pollution Control Activities Included with this Report?

Provision of additional information on source reduction, recycling, or pollution control activities is optional; therefore, there is no management, technical, nor clerical burden associated with this element of the Form R.

Reporting Burden Associated with Part II, Section 8.11

Personnel Type	First Year Burden (minutes)	Subsequent Year Burden (minutes)
Management	0	0.00
Technical	0	0.00
Total	0.00	0.00

2.1.B. Results for Electronic Submission

Table 4 summarizes the total reporting burden associated with electronic submissions of PBT and non-PBT forms. Tables 5 and 6 (refer to Excel spreadsheet) present the realistic and incidence weighted reporting burden for every data element on the Form R for first year electronic submissions of PBT and non-PBT reports. Tables 7 and 8 (refer to Excel spreadsheet) present the realistic and incidence weighted reporting burden for every data element on the Form R for subsequent year electronic submissions of PBT and non-PBT reports.

TABLE 4
TOTAL REPORTING BURDEN FOR ELECTRONIC SUBMISSIONS

	Estimated realistic time per form (hr)			Incidence weighted time per form (hr)		
	Management	Technical	Total	Management	Technical	Total
First year						
PBT	0.99	29.51	30.50	0.34	9.20	9.54
Non-PBT	0.98	29.38	30.36	0.37	10.49	10.86
Subsequent years						
PBT	0.77	20.98	21.75	0.29	6.17	6.46
Non-PBT	0.77	20.97	21.74	0.32	6.89	7.21

2.1.C. Methodology for Paper Submission

The only difference between electronic and paper submissions for first year and subsequent year Form R reporting burden is clerical time. To generate a paper copy, clerical staff would take the information prepared by the technical staff and type it onto a paper copy of the Form R. Therefore, for both PBT and non-PBT chemicals, clerical times were estimated by dividing the

currently approved OMB clerical times (Table 1) by the total number of fields on the Form R. While it may not take the exact same amount of time to line up each data element for typing, there is no reasonable way to estimate this, so giving equal time to each element was determined to be the best method. The clerical time allotted to each element was then added to the estimate for the electronic form (including management and technical time) for that element to generate time estimates for every data element for PBT and non-PBT first and subsequent year reporting via a paper Form R.

2.1.D. Results for Paper Submission

Table 9 summarizes the total reporting burden for paper submission of PBT and non-PBT forms. Tables 10 and 11 (refer to Excel spreadsheet) present the realistic and incidence weighted reporting burden for every data element on the Form R for first year paper submissions of PBT and non-PBT reports. Tables 12 and 13 (refer to Excel spreadsheet) present the realistic and incidence weighted reporting burden for every data element on the Form R for subsequent year paper submissions of PBT and non-PBT reports.

TABLE 9
TOTAL REPORTING BURDEN FOR PAPER SUBMISSIONS

	Estimated realistic time per form (hr)				**Incidence weighted time per form (hr)**			
	Management	Technical	Clerical	Total	Management	Technical	Clerical	Total
First year								
PBT	1.01	29.51	2.90	33.42	0.35	9.20	1.59	11.14
Non-PBT	0.99	29.38	1.62	31.99	0.38	10.49	0.93	11.80
Subsequent years								
PBT	0.78	21.17	2.00	23.95	0.30	6.33	1.10	7.73
Non-PBT	0.78	21.17	1.10	23.05	0.33	7.05	0.63	8.01

3. SCALED REPORTING BURDEN ESTIMATES

3.1 Scaled Estimate for PBT Chemicals

In this section, the realistic technical reporting burden estimates developed for PBT chemicals are used in combination with the currently-approved OMB form completion reporting burden estimates to generate burden estimates for each data element consistent with the OMB total. Four individual reporting burden scenarios are scaled up: first year electronic, subsequent year electronic, first year paper, and subsequent year paper. The incidence weighted values are not

used for PBT chemicals because the OMB burden estimate assumes all Form R fields are filled out by all reporters.

3.1.A. Methodology for Scaled PBT Chemical Electronic Submissions

The OMB-approved form completion burden estimates for PBT first and subsequent year technical burden are 45.2 and 30.8 hours, respectively. The following procedure was used to scale the realistic electronic PBT data element burden estimates to these OMB-approved burden estimates. Reporting burden is estimated for both first and subsequent years.

- Technical reporting burden for data elements requiring only typing or typing plus a quick information look-up (such as locating the facility's D&B number) was estimated (86.25 min, 13.42 min). The times for these steps were assumed static and, therefore, were not scaled up.

- Total static time was subtracted from both the OMB approved technical burden (2712.0 min, 1848.0 min) and the total realistic technical burden (1770.32 min, 1258.51 min) to estimate the total OMB (2625.75 min, 1834.58 min) and realistic (1684.07 min, 1245.09 min) times for those Form R data elements that require more complex information gathering and calculations.

- The OMB approved technical burden for nonstatic data elements was divided by the PBT realistic burden for nonstatic data elements (i.e., 2625.75/1770.32; 1834.58/1258.71) to calculate a scaling factor (1.56, 1.47). (Note that the PBT realistic estimates used here were not incidence-weighted, as the OMB assumption for the current estimate for PBT chemicals is that all data elements are completed).

- The scaling factor was applied to all of the nonstatic realistic data element burden estimates.

- Realistic management burden estimates were generated by multiplying the scaled up realistic technical burdens by the 20.9/45.2 or 14.3/30.8 hr ratio of management to technical burden in the current OMB-approved burden estimate for first and subsequent year reporting for PBT chemicals, respectively.

- Scaled up management and technical times were added together for each data element to estimate a total time for that data element.

3.1.B. Results for PBT Chemical Electronic Submissions

Table 14 (refer to Excel spreadsheet) presents scaled management and technical burden estimates for completing each data element of the Form R for first and subsequent year electronic submissions of PBT reports.

3.1.C. Methodology for PBT Chemical Paper Submissions

The only difference between electronic and paper submission for Form R reporting burden is the clerical time needed for typing. To generate a paper copy, clerical staff would take the information prepared by the technical staff and type it onto a paper copy of the Form R. The time required to type information into one data element on the Form R was considered to be static and unrelated to the relative degree of difficulty in determining the information to be entered into the field. For this reason, clerical time was not determined by scaling from the realistic estimates generated for technical time. Instead, clerical times were estimated by dividing the currently approved OMB clerical burden (Table 1) for PBT chemical submission by the total number of data elements on the Form R.

While it may not take the exact same amount of time to line up each data element for typing, there is no reasonable way to estimate this, so giving equal time to each element was determined to be the best method. The clerical time allotted to each element was then added to the estimate for the electronic form (including management and technical time) for that element to generate scaled time estimates for every data element for PBT first and subsequent year reporting via a paper Form R.

3.1.D. Results for PBT Chemical Paper Submission

Table 15 (refer to Excel spreadsheet) presents scaled management, technical, and clerical burden estimates for completing each data element of the Form R for first and subsequent year submissions of paper PBT chemical reports.

3.2 Scaled Estimate for non-PBT Chemicals

In this section, the realistic technical reporting burden estimates developed for non-PBT chemicals are used in combination with the currently-approved OMB form completion reporting burden estimates to generate burden estimates for each data element consistent with the OMB total. Four individual reporting burden scenarios are scaled up: first year electronic, subsequent year electronic, first year paper, and subsequent year paper. The incidence weighted values are used for non-PBT chemicals because the OMB burden estimates for non-PBT chemicals are based on actual reporting burden data from facilities.

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3.2.A. Methodology for non-PBT Chemical Electronic Submissions

The OMB-approved form completion burden estimate for non-PBT subsequent year technical burden is 16.4 hours. A first-year estimate for non-PBT technical burden of 24.1 hours was estimated by multiplying the subsequent year estimate by 147 percent.[1] The following procedure was used to scale the realistic electronic non-PBT burden estimates to these OMB-approved burden estimates. Reporting burden is estimated for both first and subsequent years.

- Technical reporting burden for data elements requiring only typing or typing plus a quick information look-up (such as locating the facility's D&B number) was estimated (59.0 min, 6.4min). The times for these steps were assumed static and, therefore, were not scaled up.

- Total static time was subtracted from both the OMB approved technical burden (1446.48 min, 984.0 min) and the total incidence-weighted realistic technical burden (629.49 min, 413.18 min) to estimate the total OMB (1387.48 min, 977.60 min) and realistic (570.49 min, 406.79 min) times for those Form R data elements that require more complex information gathering and calculations.

- The OMB approved technical burden for nonstatic data elements was divided by the non-PBT realistic burden for nonstatic data elements (i.e., 1387.48/570.49; 977.60/406.79) to calculate a scaling factor (2.43, 2.40).

- The scaling factor was applied to all of the nonstatic realistic data element burden estimates.

- Realistic management burdens were generated by multiplying the scaled up realistic technical burdens by the 11.3/24.1 or 7.7/16.4 hr ratio of management to technical burden in the current OMB-approved burden estimate for first and subsequent non-PBT chemicals, respectively.

- Scaled up management and technical times were added together for each data element to estimate a total time for that data element.

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[1]An OMB-approved estimate for first time non-PBT filers does not exist; however, the RIA for the original Section 313 rulemaking estimated the time required to complete a report in the first year to be 147% of the time required in subsequent years. This factor was applied to the OMB approved subsequent year non-PBT report completion times to calculate the first year non-PBT completion times. (U.S. EPA Regulatory Impact Analysis in Support of Final Rulemaking under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (1988).

3.2.B. Results for non-PBT Chemical Electronic Submissions

Table 16 (refer to Excel spreadsheet) presents scaled management and technical burden estimates for completing each field of the Form R for first and subsequent year electronic submissions of non-PBT reports.

3.2.C. Methodology for non-PBT Chemical Paper Submissions

The only difference between electronic and paper submission for Form R reporting burden is the clerical time needed for typing. To generate a paper copy, clerical staff would take the information prepared by the technical staff and type it onto a paper copy of the Form R. The time required to type information into one data element on the Form R was considered to be static and unrelated to the relative degree of difficulty in determining the information to be entered into the field. For this reason, clerical time was not determined by scaling from the realistic estimates generated for technical time. Instead, clerical times were estimated by dividing the currently approved OMB clerical burden (Table 1) for non-PBT chemicals by the total number of fields on the Form R.

While it may not take the exact same amount of time to line up each data element for typing, there is no reasonable way to estimate this, so giving equal time to each element was determined to be the best method. The clerical time allotted to each element was then added to the estimate for the electronic form (including management and technical time) for that element to generate time estimates for every data element for non-PBT first and subsequent year reporting via a paper Form R.

3.2.D. Results for non-PBT Chemical Paper Submissions

Table 17 (refer to Excel spreadsheet) presents realistic management, technical, and clerical burden estimates for completing each data element of the Form R for first and subsequent year paper submissions of non-PBT reports.

Appendix G

memorandum

Abt Associates Inc.

To: Laura Nielsen, U.S. EPA

From: Susan Day

Date: December 2, 2010

Subject: Modified TRI Reporting Burden Estimates for Rule Familiarization and Compliance Determination

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1. INTRODUCTION

EPA currently relies on previously developed OMB approved TRI reporting burden estimates that reflect the total time required by facilities to complete activities such as rule familiarization, compliance determination, form completion, record keeping/mailing, and supplier notification. In an earlier analysis (2004), Abt Associates Inc. developed new burden estimates for form completion, broken down by the individual data elements that make up the Form R.[1] In that assessment, a list of activities a facility typically conducts to complete each data element was developed. Next, best professional judgment was used to estimate the time needed to complete each activity. Finally, these times were summed together. The total form completion time developed through that assessment was referred to as the "realistic burden." This memo summarizes the application of the same methodology to rule familiarization and compliance determination in an analysis completed in 2005. "Realistic burden" estimates for each are presented below.

In order to develop standardized estimates that are meaningful across the range of facility types, sizes, and sectors reporting to TRI, the realistic burden is set to reflect activities at a typical TRI-reporting facility. Assumptions about the typical facility are outlined below.

[1] TRI Reporting Burden Estimates, Memo from Hilary Eustace, David Cooper, Susan Day, Abt Associates to Paul Borst, EPA, July 16, 2004. Docket # EPA-HQ-TRI-2005-0073-0012.

The typical facility:

- is mid-sized (somewhere between a small, single activity shop and a very large, very complex operation).
- is representative of all sectors covered under TRI.
- is reasonably modern and well-organized.
- has internet access with reasonable connection speed.
- has technical staff with sufficient expertise to readily understand the chemical and industrial concepts necessary for TRI program comprehension.
- will not be right at threshold for employees or chemicals, but will be well above or well below threshold. Therefore, once these determinations are made, they will not need to be re-assessed every year.
- conducts quantitative threshold assessments for 6 chemicals, and files TRI reports for 3 of these. Each chemical is typically involved in only one threshold activity.

2. COMPLIANCE DETERMINATION

2.1 Realistic Burden – First Year

To make a compliance determination the typical facility will need to conduct facility level activities such as NAICS code and employee assessment and a chemical list determination. In addition, chemical-specific threshold quantity determinations must be made. The activities a typical facility would conduct in making their compliance determination and associated burden estimates are presented in this section.

2.1.1 Facility Level Activities

NAICS Code Assessment
To conduct the NAICS code assessment, (i.e., is the facility in an EPCRA section 313-covered NAICS code?) technical staff will call accounting or other corporate department for this information (10.00 min/0.17 hour).

Employee Threshold Assessment
To conduct the employee threshold assessment, (i.e., does the facility exceed the EPCRA section 313 20,000 hour employee threshold?) technical staff will determine the whole set of full- and part-time employees, temps, contractors (excepting drivers and janitorial contractors), and off-site corporate support by checking with payroll and other management, supervisory, or accounting staff as necessary (30.00 min/0.5 hour).

Next, technical staff will calculate the total hours worked by this group during the full calendar year or up until a clear determination is made that the facility is above or below the 20,000 hour threshold by summing together quantities on timesheets or accounting system totals (30.00 min/ 0.5 hour).

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Chemical List Determination

To determine which TRI chemicals are present, technical staff will:

- Compare all materials (including mixtures, alloys, and fuels) used/manufactured at the facility to the EPCRA section 313 (TRI) list. This task will involve:
    - Gathering all MSDSs, or other batch info, product specs, certificates of analysis, labeling information, etc (60.00 mins/1.0 hour).
    - Reviewing the "Regulatory Information" section of the MSDS. Where an MSDS is not available, technical staff will compare available supplier data on chemical constituents with the TRI chemical list (90.00 min/1.5 hours).
    - For PBT chemicals, technical staff will assess if there are likely PBT chemicals present at below *de minimis* in mixtures used by the facility. This step is needed since the *de minimis* exemption is allowed for supplier notification, but is not allowed for PBT chemicals for threshold determination or release reporting (60.00 min/1.0 hour).

Table 1: Facility-Level Compliance Determination Burden	
NAICS Code Assessment	0.17 technical hours
Employee Threshold Assessment	1.0 technical hours
Chemical List Determination	3.5 technical hours
Total	4.67 technical hours

2.1.2 Chemical-Specific Activities

As mentioned above, the typical facility will conduct quantitative threshold assessments for six chemicals. For each TRI chemical, technical staff will review all manufacture/uses of the chemical at the facility to determine if they fall under the definition of manufacture, process, or otherwise use. This task will involve talking with operations staff, facility chemists, reviewing process flow diagrams, conducting facility walkthrough and reviewing standard operating procedures (30.00 min/0.5 hours).

For each TRI chemical manufactured, processed, or otherwise used, technical staff will determine the total annual quantity of the chemical for each threshold activity. This activity will include determining the percentage of the TRI chemical in a mixture, alloy, or fuel. The method to calculate threshold quantity for process OR otherwise use is:

- Determine the material usage quantity within each applicable threshold activity through a review of inventory records, purchase records, operation records, or discussions with operations staff (30.00 mins/0.5 hours). This task may require a determination of the total material usage quantity through inventory or purchase records, followed by dividing this total into the different threshold activities through operations records or discussions with operations staff. For the purposes of this analysis, however, it is assumed that each chemical typically falls within only one threshold activity.
- If the material used is a mixture, determine the chemical concentration in the mixture through

a review of the MSDS, batch analysis, or other supplier information (30.00 min/0.5 hours).

- Multiply total material usage quantity by chemical concentration to determine total annual chemical usage quantity (2.00 min/0.03 hours).

The total time required to calculate a threshold quantity for process or otherwise use is 62.00 min/1.0 hour.

For intentional manufacture, technical staff will determine the annual quantity manufactured through production records (30.00 min/0.5 hours).

The method used to calculate the threshold quantity for coincidental manufacture is to determine the annual quantity for combustion products and reaction by-products or impurities as follows:

- *Combustion products*: Technical staff will determine the annual quantity manufactured through use of emission factors by:
    - Locating the most applicable emission factor. Numerous EPA sources are available such as AP-42 TRI chemical specific and industry specific guidance. Non-EPA sources include university research and trade associations (30.00 min/0.5 hours).
    - Determining the annual quantity of input material by reviewing purchase records, inventory records, and/or operational records (30.00 min/0.5 hours).
    - Multiplying this material usage quantity by the emission factor to determine the amount of material released from each point during the year and, if necessary, converting the amount of material released to pounds (or grams for dioxins) by applying the appropriate conversion factor (6.00 min/0.1 hours).
    - Finding the average pollution control efficiency for the emission factor from the AP-42 listing or emission factor source, or identifying if the emission factor was generated from uncontrolled sources. Using this pollution control efficiency, technical staff will extrapolate the total quantity generated from the quantity emitted (10.00 min/0.17 hours).
    - The total time required to calculate a threshold quantity in coincidental manufacture is 76.00 min/1.27 hours.
- *Reaction by-products or impurities:* Technical staff will identify the quantity of chemical coincidentally manufactured through discussions with facility chemists, production records, operations staff, chemistry literature, or EPA TRI guidance documents (45.00 min/0.75 hours).

Once annual threshold quantities have been calculated, technical staff will compare the annual threshold quantities for each chemical with the TRI regulatory threshold limits by entering the threshold quantity in *TRI-MEweb* for each chemical. *TRI-MEweb* will indicate for which chemicals TRI regulatory thresholds have been exceeded (0.25 min/0.0 hours).

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Average Realistic Chemical-Specific Threshold Assessment

It is assumed in this analysis that a chemical is typically only involved in one threshold activity at a facility. However, this activity may be a processing, an otherwise use, or a manufacturing activity. As outlined above, the total time to calculate the threshold quantity for a chemical involved in a processing activity or an otherwise use is 62.00 minutes or 1.0 hour. There are three different scenarios for calculating the threshold quantity for a chemical involved in a manufacturing activity depending on whether the chemical is intentionally manufactured, a product of combustion, or a reaction by-product or impurity (0.5 hours, 1.27 hours, or 0.75 hours, respectively). The average burden of these three methods is 0.8 hours. Since estimates for intentional manufacture and coincidental manufacture of combustion products or reaction by-products and impurities may not occur with equal frequency, this average has been rounded up to 1.0 hour. In addition, manufacturing, processing, or otherwise use activities may not occur at the same frequency. Therefore, a more accurate estimate is made if estimates for all three activities are rounded up to the most burdensome. The resulting burden estimates are summarized in Table 2.

Table 2: Average Chemical-Specific Threshold Assessment Burden	
Otherwise Use chemical specific threshold quantitative assessment	1.0 technical hour
Processing chemical specific threshold quantitative assessment	1.0 technical hour
Manufacturing chemical specific threshold quantitative assessment	1.0 technical hour
Average burden for quantitative assessment of different threshold activities	1.0 technical hour

Total Realistic Chemical-Specific Threshold Assessment Burden

To make a compliance determination, a facility must 1) determine the appropriate threshold activity for each chemical; 2) determine the quantity of chemical used in the threshold activity, and 3) compare the quantity of chemical being used in a threshold activity to TRI regulatory reporting thresholds. As outlined above, it will take a facility 30.0 minutes or 0.5 hours to determine in which threshold activity the chemical is used. On average, 1.0 hour will be required to determine the quantity of chemical being used in a threshold activity. Finally, it will take a facility 0.25 minutes or 0.0 hours to enter this quantity into *TRI-MEweb* for comparison with TRI regulatory reporting thresholds. A summation of burden estimates associated with these three activities is presented in Table 3.

Table 3: Total Realistic Chemical-Specific Threshold Assessment Burden	
Determine which threshold activity is occurring	0.5 technical hours
Average quantitative assessment burden	1.0 technical hour
Enter threshold quantity in *TRI-MEweb*	0.0 technical hours
Total Per Chemical Burden	1.5 technical hours

2.1.3 Total Realistic First Year Compliance Determination Burden

Total realistic first year compliance determination burden is estimated by summing the facility level compliance determination burdens and the chemical-specific compliance determination burden across the six chemicals for which a typical facility will need to conduct threshold assessments. The estimated total realistic first year compliance determination burden is presented in Table 4.

Table 4: Total Realistic First-Year Compliance Determination Burden	
Facility level burden	4.67 technical hours
6 chemicals x 1.5 hour / chemical	9.0 technical hours
Total	13.67 technical hours

2.2 Realistic Burden – Subsequent Year

In subsequent years it is assumed that NAICS code and employee threshold determinations will typically not need to be reassessed, thus no burden will be incurred. It is also assumed that no new activities are required relative to quantitative threshold assessments. Some time is, however, required to review facility activities and ensure that no significant changes have occurred.

2.2.1 Facility Level Activities

At the facility level, technical staff will assess facility activities and products/mixtures used to determine if there are significant process and/or chemical use changes at the facility requiring modified or new quantitative threshold assessments. As part of this assessment, they will talk to production staff, review operations records, and review MSDSs (60.00 min/1.0 hour).

Subsequent year burden estimates for compliance determination activities are summarized in Table 5.

Table 5: Total Realistic Subsequent Year Compliance Determination Burden With No Staff or Process Changes	
NAICS Assessment	0.0 technical hours
Employee Threshold	0.0 technical hours
Facility level review of operations to determine that there were no significant chemical use and/or process changes	1.0 technical hour
Total	1.0 technical hour

2.3 Summary of Compliance Determination Burden Estimates

Table 6 summarizes the realistic burden estimates developed in this analysis. Realistic management burden estimates are based on best professional judgment of what is actually occurring at a typical TRI-reporting facility. No clerical burden is provided as it is assumed that a typical facility will be using *TRI-MEweb*, and that technical staff will conduct the data entry into *TRI-MEweb* as part of their efforts.

Table 6: Compliance Determination Unit Burden Hour Estimates

	Management	Technical	Clerical	Total Hours
Realistic Estimate – 1st year	1	13.67	0	14.67
Realistic Estimate – subs year	0.25	1	0	1.25
Current OMB Estimate – 1st year	4	12	0	16
Current OMB Estimate – subs year	1	3	0	4

3. RULE FAMILIARIZATION

3.1 Realistic Burden Estimate - First Year

To familiarize themselves with the TRI reporting requirements, the typical facility will need to review TRI program content both generally and as applicable to their facility by:

- Reading the Reporting Forms and Instructions booklet (600 min/10 hours).
- Reviewing all or selected portions of relevant EPA TRI guidance documents including:
    - Q & A document (120 min/2 hours)
    - Industry-specific guidance (if it exists) or most closely applicable (90 min /1.5 hour)
    - Electricity Generating Facilities Guidance (for fuels use) (30 min/0.5 hours)
    - Chemical Specific Guidance(s) (120min/2 hours)
- Attending a training session (360 min/6-hour live session or both halves of a web-based training).
- Contacting the EPCRA hotline or other information resource for clarifications/facility-specific determinations (30 min/0.5 hours).

Summing across these activities, the total realistic first year rule familiarization burden is estimated at 1,350 min/22.5 hours.

3.2 Realistic Burden - Subsequent Year

It is assumed that no rule familiarization will occur in subsequent years. Even with a process change, technical staff will use existing knowledge of the TRI program to determine how TRI

applies to this process change. Table 7 summarizes rule familiarization burden estimates for the first and subsequent years.

Table 7: Rule Familiarization Unit Burden Hour Estimates				
	Management	**Technical**	**Clerical**	**Total Hours**
Realistic Estimate – 1st year	1	22.5	0	23.5
Realistic Estimate – subs year	0	0	0	0
Current OMB Estimate – 1st year	12	22.5	0	34.5
Current OMB Estimate – subs year	0	0	0	0

Peer Review Summary Statement with EPA Responses

This technical document underwent peer review to assess the integrity and value of the revised methodology, Ratio-Based Burden Methodology (RBBM). The reviewers represented academia, industry, and non-profit sectors with expertise in industrial engineering, social science/public policy, and mathematical methodology (see Table H-1 below). Overall the reviewers were positive, concluding that the methodology changes:

- Are reasonable, appropriate, and well-supported
- Achieve efficiency, administrative constancy, and transparency

Table H-1: Peer Reviewers Represent a Range of Disciplines and Perspectives

Reviewer Name	Organization	Sector Representing
Jeffrey Burke, BA	Executive Director, **National Pollution Prevention Roundtable** (in addition to twenty-plus years experience as Senior Environmental Scientist with US EPA Region 3)	Non-profit/Government
Mark Cohen, PhD Economics	Vice President for Research, **Resources for the Future**	Social Science/Public Policy
Mark Stephan, PhD, Politics, Associate Professor	Associate Professor, **Washington State University**	Social Science/Public Policy, Mathematical Methodology
Michael Walls, MBA, JD	VP, Regulatory and Technical Affairs, **American Chemistry Council**	Social Science/Public Policy
Joelie Zak, BS, BA	Executive VP of **Scientific Control Laboratories**	Engineering/Science

Reviewers were asked for overall impressions and assessments of 1) goal attainment, 2) validity and consistent application of methodology decision rules/assumptions, and 3) model maintenance requirements. Beyond these assessments, EPA requested comments on the merits and methods of survey calibration.

On **goal attainment**, reviewers generally agreed that the stated goals of simplification, improved internal consistency, and improved transparency are met (with only one disagreeing about transparency). Additional perceived benefits included: 1) increased access to burden estimates and 2) better understanding of uncertainties associated with TRI burden estimates.

Regarding **decision rules and assumptions**, reviewers consistently agreed with the internal logic and conclusions of the Ratio-Based Burden Methodology. However, two noteworthy exceptions in which one or more reviewers raised concerns: 1) setting the value of for PBT/non-PBT burden equal to one, and 2) holding non-Form burden constant.

In response to EPA's solicitation for input on **survey calibration** as a future enhancement, three out of five reviewers recommended this type of enhancement (including one non-industry reviewer). More information is provided in EPA's response below.

Based on the peer review endorsement, EPA concluded that the methodology is sound without need of design changes or major procedural adjustments. Regarding document quality, the body of the report is considered well-written with Appendices receiving mixed reviews (although considered very thorough). EPA has revised the document, addressing specific questions/critiques of the methodology and implementing editorial suggestions from peer reviewers and other sources.

SELECTED REVIEWER COMMENTS AND EPA RESPONSES

While reviewer comments were generally positive, EPA believes that responses and additional explanations on several issues are justified to ensure that EPA's position is clear and to avoid potential misunderstandings.

1. Accuracy Questions Remain on Burden Hours

Review Comments: Although it is beneficial to simplify calculations, there is still a need to validate the burden estimates to be sure they are representative of reporter experiences. For example, one reviewer stated, "The measure of the new methodology's estimate should not be a simple comparison to the estimates generated under the prior methodology—the new methodology should return significant improvements in the (absolute) estimation of TRI burden."

EPA Response: EPA acknowledges that some reviewers (here and in public comment venues) question the credibility of the system of factors used to characterize reporting activities, as well as values assigned to those factors. EPA believes these bases, as implemented in both the existing and revised methodologies, comply with PRA requirements that burden estimates be provided, "to the extent practicable." TRI burden estimates reflect a reasonable sense of the average conditions and an appropriate level of specificity. Further, EPA emphasizes that the purpose of TRI burden estimates—and its burden accounting system in general—is to track changes from year to year against an established baseline.

2. PBT Burden—Modeling versus Accounting

Review Comments: Some reviewers are concerned by the methodology's simplification that sets PBT/non-PBT burden equal to one, due to lack of evidence to quantify an average value representative of the overall reporter population. One reviewer asserts, " …in real life reporting, there is currently extra burden placed on specific PBT chemical TRI filings that does not seem to be accounted for in the existing or new model." Another states, "ACC does not agree with the conclusion that reporting for PBT and non-PBT substances are similar enough to allow the same unit-burden-hour estimate. PBT reporting as a whole takes more time than non PBTs, largely due to the de minimis exception not applicable to non-PBT substances."

EPA Response: There are two parts to this response. First and foremost, EPA recognizes the need to distinguish between PBT and non-PBT burden by including a specific ratio model for that purpose. At this time, however, EPA is unable to specify the value of the ratio in the context of RBBM which requires verifiable and internally consistent unit burdens. Without substantiating evidence for this type of model assertion (see Decision Rules in main report) EPA has decided to implement a default ratio equal to one, while providing a placeholder for later revision in the event that additional information becomes available. Second, though the value of the ratio is left unspecified, this methodology revision carries forward certain prior assumptions so that the net effect of PBT reporting is incorporated in overall totals. Specifically, the previous calculation's effects of a higher PBT unit burden for 20% of chemicals are rolled up into the new unit burden (*Nominal Form R unit burden*). In back-calculating this base number of 35.7 hours per Form R, the unit burden reflects overall average conditions, and is elevated above the value that would have been otherwise obtained—at about 30 hours/form—had only non-PBT burden been used to determine *Nominal Form R unit burden.* An important note on RBBM and its benefits: the simplified comprehensive *Nominal Form R unit burden* plus the *A/R* model (which links to Form A unit burden) provides a focal point for burden-estimate discussions, reducing confusion associated with keeping up with additional unit burdens and chemical counts from multiple subpopulations.

3. Survey Calibration Enhancement

Review Comments: Three out of five reviewers recommend enhancement via some form of survey calibration. Of these three, the two industry reviewers make their recommendations based on 1) concerns that the burden estimates are generally too low and 2) the need to measure a distinction between PBT and non-PBT reporting burden. The third supporter does not see the need, but admits that pressure from any party would merit survey calibration. One of the non-supporters does not recommend survey calibration for this application, but stresses that EPA is not correctly focused on the purpose of survey calibration. This reviewer states that the purpose of survey calibrated burden estimates is to determine if data elements should be dropped or altered (i.e., consider cost of the information compared to its value).

EPA Response: EPA appreciates the thoughtfulness and thoroughness of the reviewers' comments on survey calibration. At this time, and as stated above, EPA believes the current bases comply with PRA requirements for reasonable estimates. In addition to increased Agency effort, EPA is concerned about imposing additional burden on the reporting community to participate in a survey designed for the purposes of calibrating burden estimates.

4. DIOXIN (and Form R Schedule 1) Burden Not Included

Review Comment: The revised methodology does not address Dioxin reporting (implemented in 2007) and the burden contributions from Form R Schedule 1.

EPA Response: At the time of the calculations for the revised methodology, conditions are those of the 2008 ICR. As such, the Form R Schedule 1 requirement was not in place. Subsequently, the addition of Form R Schedule 1 reporting is estimated in the Supporting Statement of the 2012 ICR Renewal, using the techniques of RBBM's Form Element Estimation

(in Appendix C). Note, however, that the impact of Schedule 1 burden on total Form R burden is very small (.00516 hours overall per Form R).

5. Weighted Average Wage Rate (WAWR) of $51 Seems Low

Review Comment: According to one reviewer "In general the weighted average wage rate of $51 seems low given the engineering and managerial expertise required. We are aware that in similar (and admittedly less complicated) analyses conducted in other areas, the 90th percentile would be used and adjusted upward by 40 percent to get to a more accurate representation of non-wage compensation. In addition, with electronic data entry and submittal, there may well not be any appreciable clerical involvement with TRI reporting. The use of the clerical wage level also results in an average wage rate that is too low."

EPA Response: The WAWR is based on statistics generated by the US Department of Labor Bureau of Labor Statistics (BLS) and includes non-wage compensation. As shown in the table below, EPA uses the average wage rate and adjusts upward by 60.40% (in this June 2010 example) to incorporate non-wage compensation. EPA's WAWR method weights each category of management, technical, and clerical labor according to the proportional contribution (.03, .89, and .08 respectively) as defined in Appendix E based on the Abt Associates Engineering Studies. The value of $51 reflects these analytical decisions for September 2009 conditions using a method whereby wage rates are updated to current dollars using the employment cost index (no longer used in RBBM). Applying the current version of RBBM and June 2010 conditions, the result of $49.62/hr is obtained. Further detail is provided in the table below.

Table H-2: Derivation of the Weighted Average Wage Rate (WAWR)
(June 2010)

Wage Type (Burden Proportion)	**Managerial (.03)**	**Technical (.89)**	**Clerical (.08)**	**WAWR Composite**
Occupational Type	Management, business, and financial	Professional and related	Office and administrative support	WAWR $/hr
Wages and Salaries	$38.84	$32.73	$15.75	
Total benefits	$16.85	$13.08	$6.81	
Overhead	$6.60	$5.56	$2.68	
Total Loaded Rate	**$62.29**	**$51.37**	**$25.24**	
WAWR Contribution	**1.87**	**45.72**	**2.02**	**49.62**
Based on June 2010 wage data. http://www.bls.gov/ncs/ect/#tables.				