

FINAL REPORT

ECONOMIC IMPACT AND SMALL BUSINESS DEFINITION ANALYSIS FOR THE FINAL TSCA SECTION 8(a) PRELIMINARY ASSESSMENT INFORMATION RULE

Prepared for
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REGULATORY IMPACTS BRANCH
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
U.S. ENVIRONMENTAL PROTECTION AGENCY
401 M STREET, S.W.
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I. EXECUTIVE SUMMARY

A. INTRODUCTION

Under section 8(a) of the Toxic Substances Control Act (TSCA), the Environmental Protection Agency (EPA) is authorized to require firms to report information related to the volume of production, production processes, work and environmental exposure, and other information concerning the production of certain chemicals. (See the preamble to the final rule for an explanation of how chemicals were chosen.) Because small chemical manufacturers might not be able to sustain the additional costs associated with such reporting, however, section 8(a) also requires that small manufacturers and processors (as defined by the Administrator) be excluded from these reporting requirements, unless the chemicals involved have been proposed for certain regulatory actions.

The section 8(a) Preliminary Assessment Information Rule is designed to gather general production, use, and other information on exposure from manufacturers and importers of about 2,000 chemicals as well as from some processors of those chemicals. This information is intended to aid priority-setting and risk assessment for these chemicals. This report details the results of an analysis of the cost and economic impact of the Preliminary Assessment Information Rule and examines various small business definitions as required by section 8(a) of TSCA, in order to determine the definition of small business for this rule.

B. METHODOLOGY

To analyze the cost of the rule to manufacturers, the list of chemicals included in the rule was merged with the TSCA Chemical Substance Inventory^{1J} yielding a list of plant sites which produce those chemicals. Plant-site information was then aggregated to the firm headquarters level and combined with the firm's annual sales data from the Dun and Bradstreet files. Both fixed and variable costs of reporting for the Preliminary Assessment Information Rule were estimated. The estimates were used to determine the total cost of the rule to industry. Furthermore, the impact of the rule on individual companies was estimated by comparing the average company's costs of reporting with its profits, which were estimated to be six percent of sales.

^{1J}Information received under the Inventory Reporting Regulations, 40 CFR 710 (42 FR 64572, December 23, 1977).

We made several assumptions because Dun and Bradstreet sales information was not available for all Inventory plant sites, and because production volume was unknown for some sites. The most conservative assumptions were chosen so that the analysis would overestimate rather than underestimate the cost. These assumptions included:

- (1) If production volume of a chemical is unknown at a plant site that qualifies for an exemption based on its parent company's sales, the plant site will have to report on the chemical.
- (2) If sales information is unknown for the parent company of a plant site that manufactures a chemical in quantities below the production volume limit, the plant site will have to report on the chemical.
- (3) If both production volume and sales information are missing, the plant site will have to report on the chemical.

In Chapter III, we discuss these assumptions in detail.

C. UNIT COSTS

Unit reporting costs have been divided into fixed cost (e.g., familiarization with the reporting requirements) and variable cost (e.g., estimating off-site use to complete a form). Because these costs were based on a standard process for obtaining data to complete the forms, the changes in the form made between the initial proposal and the final rule had no measurable impact on the reporting costs. In addition, changes in the content and format of the final form, which is simpler than the proposed form, tended to offset the addition of costs that were not included in the economic analysis of the proposed form. Thus, the total fixed costs for manufacturers of the Preliminary Assessment Information Rule are estimated to be \$480 per production site. Variable costs of reporting are estimated to be \$420 per chemical produced at that site.

D. REPORTING BY SELECTED PROCESSORS

After EPA reviews and compiles the reports from manufacturers, the Agency may find that industry reported insufficient information on customer use. In such a situation, the rule provides that EPA may require selected processors of the chemical to complete a separate form. We expect it will cost processors approximately \$255 per site plus \$100 per report to provide this information.

E. SMALL BUSINESS DEFINITION

EPA's policy in setting a small business definition has been to balance the relative burden of providing information against the needs for that information. In the past,^{2J} EPA has explored several parameters (company sales, sales per chemical, assets, employment, production, and number of sites per firm) for a small business definition. The past examination concluded that company annual dollar sales alone or combined with another parameter were generally the most reasonable criteria to use to define a "small business."

For this rule, small size as defined by dollar sales alone is not a sufficient reason to exempt a company from reporting, however. Production of a large quantity of a chemical may indicate a significant degree of human and environmental exposure and, possibly, a risk that should be assessed. Although a large production quantity does not necessarily indicate significant exposures, it may indicate widespread use of the chemical and thus the potential for significant release. For this reason, EPA needs information regarding large-volume chemicals even from small manufacturers. Therefore, the small business definition includes a provision that if production of a chemical exceeds a certain limit, the plant site would have to report on the chemical, regardless of company size.

For this rule, EPA does not consider production of an extremely small quantity of a given chemical to be significant enough to justify a reporting requirement. Therefore, a plant site need not report on a chemical that it produces in quantities below 500 kilograms, regardless of company size.

Thus, the effects of various small business definitions consisting of a single annual sales figure combined with a production volume limit, and the small quantity exemption were examined in this report. Fourteen different cases were examined.

Baseline (no small business or small quantity exemption.)

No small business exemption; 500 kilogram small quantity exemption.

\$1 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$3 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

^{2J}See Analysis of Options for Definition of Small Business, and Estimated Cost of the Initial Section 8(a) Reporting Requirement, Arthur D. Little, EPA Report Number 561/1-77-001, November 1977.

\$5 Million sales limit and 100,000 pounds production limit;
500 kilogram small quantity exemption.

\$10 Million sales limit and 100,000 pounds production
limit; 500 kilogram small quantity exemption.

\$30 Million sales limit and 100,000 pounds production
limit; 500 kilogram small quantity exemption.

\$50 Million sales limit and 100,000 pounds production
limit; 500 kilogram small quantity exemption.

\$1 Million sales limit and 1,000,000 pounds production
limit; 500 kilogram small quantity exemption.

\$3 Million sales limit and 1,000,000 pounds production
limit; 500 kilogram small quantity exemption.

\$5 Million sales limit and 1,000,000 pounds production
limit; 500 kilogram small quantity exemption.

\$10 Million sales limit and 1,000,000 pounds production
limit; 500 kilogram small quantity exemption.

\$30 Million sales limit and 1,000,000 pounds production
limit; 500 kilogram small quantity exemption.

\$50 Million sales limit and 1,000,000 pounds production
limit; 500 kilogram small quantity exemption.

After reviewing the impacts of the various alternatives, and analyzing the costs associated with each definition, the Agency has chosen for purposes of the section 8(a) Preliminary Assessment Information Rule to define a manufacturer or processor plant site as small in respect to a given chemical when:

- a. total annual sales of the parent company (on all products) are less than \$30 million, and
- b. the plant site's annual production (or amount processed) of the chemical is less than 100,000 pounds.

Annual sales figures are based on the sum of all plant sites owned or controlled by the parent company of the reporting plant site. A plant site is exempt from reporting on a chemical if these criteria are met.

Processors of selected chemicals may also be required to report under certain circumstances and are also covered by the small business exemption. We believe that the financial characteristics of manufacturers and processors are similar; in fact, many processors are also manufacturers and vice versa.

Therefore, the \$30 million annual sales small business definition should also apply to processors. Similarly, whether manufactured or processed, the quantity of 100,000 pounds at a single site is significant and should be reported.

F. TOTAL COST AND ECONOMIC IMPACT

Approximately 820 firms are subject to the Preliminary Assessment Information rule when the small business definition is \$30 million with a 100,000 pound production limit. The total cost of this rule is expected to be about \$4.4 million.

The small business exemption decreases the number of reporting companies with sales below \$30 million from 286 (Table 5) to 103 (Table 10). Of the 183 firms exempted, however, production data are missing for 91. Some of these may still have to report because of large production volume, but the number of such companies is not expected to be great because 54 of the 91 are extremely small companies with sales under \$5 million.

G. SENSITIVITY ANALYSIS

A sensitivity analysis was performed on the possible error introduced by the assumptions that plant sites with missing data will be required to report (see page 2). At a small business definition of \$30 million, relaxing assumptions 1, 2, and 3 would reduce industry's total compliance cost from \$4.4 million to \$3.6 million. In this case, only 627 firms would report under the rule.

The total cost of the rule is relatively insensitive to the level of the small business definition, because over 80 percent of the reports which must be filed will be generated by companies with sales greater than \$30 million. With no small business exemption or small quantity exemption, the cost of the rule is \$5.0 million; with a \$50 million and 1,000,000 pound small business exemption, its cost is \$4.3 million.

The total cost and impacts of the rule change in direct proportion to changes in assumptions regarding the cost of the form and the profitability of the industry. The total cost is particularly dependent on the estimated cost to submit the form. This depends greatly on the assumptions of which personnel complete the form.

II. INTRODUCTION

Under section 8(a) of the Toxic Substances Control Act, the Administrator is authorized to require firms to report to the Environmental Protection Agency information related to the volume of production, production processes, worker and environmental exposure, and other information concerning the production of certain chemicals.

The section 8(a) Preliminary Assessment Information Rule is designed to gather general production and use information and other information on exposure to aid initial priority-setting and risk assessment of chemicals. The rule initially applies to the manufacturers and importers of about 2,000 chemicals. It also contains provisions to require reports from processors of certain chemicals if the Agency determines that more information is needed to complete the preliminary assessment.

This report details the results of an analysis of the total cost and economic impact of the Preliminary Assessment Information Rule. The impact is estimated by comparing the average company's costs of reporting with its profits, which in turn are estimated as six percent of the company's sales. This report also examines the different impacts resulting from various small business definitions. This latter analysis was used by EPA to determine the small business definition in the Preliminary Assessment Information Rule.

The report is divided into seven sections: Executive Summary, Introduction, Methodology to Estimate Costs to Manufacturers, Unit Cost Estimates, Total Cost and Economic Impact Analysis, Analysis of Options for Small Business Definition, and Sensitivity Analysis. The methodology section contains a description of key assumptions which have an effect on the final results. Although the effects of these assumptions on the analysis have been explored wherever possible (see Section VII), a proper understanding of the assumptions is crucial to a correct interpretation of the results.

III. METHODOLOGY TO ESTIMATE COSTS TO MANUFACTURERS

A. METHODOLOGY

In order to determine the costs to industry of the rule and its impact on chemical companies of various sizes, two data bases were merged--the list of chemicals the rule covers and the TSCA Inventory. The result was a list of plant sites which had reported producing these chemicals.

The data thus obtained on plant site production were organized by parent company. These data were then combined with the company's annual sales data taken, whenever available, from Dun and Bradstreet files. The result was one list identifying each company by Dun and Bradstreet number, and showing parent company sales and section 8(a) production data by site. In this discussion, we refer to this list as the production/sales list.

Figure 1 displays the logic used in sorting the companies, plant sites, and chemicals for this analysis.

Data on the production/sales list were sorted into groups of companies with similar sales. For each sales category, we showed the number of sites, and production volumes at those sites, for each company. In this discussion, we refer to these as the sales lists. The sales categories by dollar figures were as follows:

\$ 0 - less than \$ 1 million
1 - less than 3 million
3 - less than 5 million
5 - less than 10 million
10 - less than 30 million
30 - less than 50 million
50 - less than 100 million
100 - less than 500 million
500 million or more

Two additional categories for companies with missing sales figures were also included, one with production volume greater than or equal to the cut-off production volume, and one with production volume below the cut-off volume for the specific chart.

Within each sales category, four subcategories were established:

- (1) if sales category is not exempt,
- (2) if sales category is exempt up to 500 kilograms production,

- (3) if sales category is exempt up to 100,000 pounds of production, and
- (4) if sales category is exempt up to 1,000,000 pounds of production.

The first subcategory listed every company, its number of sites, and the number of chemicals it produces. The second subcategory listed the companies with the number of sites and chemicals for which production is over 500 kilograms. The third subcategory listed the companies with the number of sites and chemicals for which production is over 100,000 pounds. And the last subcategory listed companies, sites, and chemicals produced in quantities over 1,000,000 pounds.

The next step was to count the number of companies, sites, reports, and dollar sales shown on each sales list. The results of the count were transcribed onto charts summarizing the cost and impact of each small business definition (see Tables 4 through 17 in Chapter VI). For example, to find out how many sites belonging to companies with \$0 to \$1 million in sales will be required to submit reports under an exemption of \$30 million-100,000 pounds production, we proceeded in this way: We referred to the \$0 to \$1 million sales list and counted the number of sites listed in the over 100,000 pounds production subcategory. This figure represents the number of sites required to report. We then entered that figure in the \$0 to \$1 million block in Table 10, the \$30 million-100,000 pound exemption chart. If we wanted the same information for companies with sales in the \$30 to \$50 million range, we would reference the \$30 to \$50 million dollar sales list, count the number of sites in the subcategory, "If sales category is exempt up to 500 kilograms production," and enter that figure in the appropriate block in Table 10. We would reference this subcategory because the 500 kilogram exemption applies to all companies regardless of size.

Total cost of reporting was calculated by multiplying the fixed cost of reporting times the number of plant sites. That figure was then added to the variable cost of reporting multiplied by the number of chemical reports.

To evaluate the impact of the Rule on a company, the total cost of reporting was estimated as a percent of profit. Using an estimated profit margin of six percent of sales,^{3J} the calculation for each company is:

$$\frac{\text{Total Cost}}{\text{Annual Sales} \times .06} \times 100$$

^{3J}Charles H. Kline and Co., Inc., Kline Guide to the Chemical Industry, 4th ed., 1980, p. 32.

ICF Incorporated, Chemical Industry Financial Data Base, unpublished.

B. EXCEPTIONS

Six hundred forty-seven plant sites on the production/sales list were not identified by ultimate Dun and Bradstreet numbers, and thus were not associated with a parent company. To resolve the problem, both the plant site production/sales list and the sales lists were alphabetized and searched manually for the name of each unidentified entry. Of the 647 sites, 294 were eventually identified by this method. Thus, the 294 sites were additional sites belonging to parent companies whose names had been previously entered on the production/sales list. Sixty-five other unidentified plant sites were found to be associated with parent companies that had not been previously listed. The names of those parent companies were added to the sales lists along with the plant sites. Two hundred eighty-eight plant sites of the original 647 remain unidentified by parent company; 63 of these are also missing production volumes. To maintain the most conservative assumption, the 288 unidentified sites were included in a "Missing" column.

Two hundred six companies supplied production data but lacked sales data. (See column labeled "Missing Sales" on Table 4 in Chapter VI.) Of the 206, 194 produce chemicals in quantities greater than the 500 kilogram small quantity exemption. When the production volume of these companies exceeds the small business exemption limit, they will be required to file reports. Therefore, they were included in the "Missing Sales (Over Production Limit)" category. When their production volume fell below the limit, they were included in the "Missing Sales (Under Production Limit)" category. In the latter case, it is still not known if these companies will be required to submit reports. We assumed that these companies would have to report and then tested the sensitivity of our total cost estimates to this assumption (see Chapter VII).

Other information was also occasionally missing. For example, the volume of chemicals produced by certain companies at some of their sites was unknown. If it was established fact that such companies must file reports on these chemicals because their sales figures disqualify them from a small business exemption, then we assumed that reports should be submitted on the chemicals in question. (This assumes that they are produced in quantities over 500 kilograms (1,100 pounds). This assumption is based on analysis showing that over 90 percent of all chemicals with known production on the production/sales list are produced in quantities over 500 kilograms.) In the case of companies which do qualify for an exemption based on sales, it is not known if they must file reports on chemicals for which production data are missing. These chemicals were included in the "Missing Production" category.

Thus, the numbers in the "Missing Production" category vary with the size of the small business exemption. A company with \$40 million in sales, for example, must report on chemicals produced--except those produced in quantities under 500 kilograms--if the exemption is set at \$30 million. But if the exemption is raised to \$50 million, it is not known if the company will have to submit reports on chemicals for which it did not report production volume. In the latter case only, missing production data are categorized as such. Figure 1 above illustrates the process of classifying sites and reports.

C. KEY METHODOLOGICAL ASSUMPTIONS

Certain assumptions had to be made with regard to the missing data we have just described in order to calculate the total cost and economic impact figures for the various small business definitions under consideration. In each case, we chose the most conservative assumption so that the analysis would overestimate rather than underestimate the cost. We discuss these assumptions below:

Assumption 1. The industry cost estimates (see Tables 4 through 17) were calculated under the assumption that if a plant site's production volume information for a given chemical is unknown, the plant site will have to report, even if it qualifies for an exemption based on sales.

All chemicals produced by a company whose production volume information was missing were included in the "Missing Production" category when we did not know if the company would be required to report because it qualified for an exemption based on sales. In calculating the total cost to industry, we assumed that the chemicals in this category were produced in quantities sufficient to require reporting regardless of company size. Information on production volume may have been unavailable for the following reasons: (a) production volume was claimed to be confidential, and (b) the company was a small business and did not have to report production.

We further assumed that a company which did not produce a given chemical in 1977 would not produce it during the reporting year for this rule.^{4J} However, these chemicals may be batch process chemicals which might be produced in subsequent years. If, at the time of this reporting requirement, they were in production, then they would be reported. The additional costs to industry of reporting these chemicals was calculated for the purpose of the sensitivity analysis (see Section VII).

Most of the chemicals on the list are high-volume chemicals. It is, therefore, not unreasonable to expect that production may indeed exceed 100,000 pounds, even for smaller firms. In our opinion, this assumption does not significantly overstate the expected number of reports from smaller companies or the costs involved in submitting them.

^{4J}In some cases, the Inventory allowed manufacturers to report a chemical if they did not produce the chemical during the period to be reported.

Assumption 2. Sales information on certain firms was unavailable. Thus, they could not be categorized for purposes of evaluating the small business definition (see the category labeled "Missing Sales" on Tables 4 through 17 in Chapter VI). In estimating the total cost, it was assumed that plant sites belong to these companies would be required to report, even if production volume of the reportable chemical were under the production limit.

Sales information was unavailable for two reasons. First, sales information was unavailable from the Dun and Bradstreet files. Second, the production/sales list showed a plant site or subsidiary whose parent company could not be determined from reference texts. In line with our previous conservative assumptions, we assumed that plant sites of companies for which sales data are lacking will have to report, regardless of production volume of the reportable chemicals. We made the same assumption when sales were unknown because the parent company could not be identified. (The effect of making the opposite assumption is analyzed in Section VII of this report). It is likely that this assumption overstates the cost of the rule because some of the firms in the category probably fall below the sales level of the small business definition. If firms in this category are above the level of the small business definition, the total cost of the rule is unaffected.

Assumption 3. The industry cost estimates were calculated under the assumption that if both parent company sales and production volume were missing for a given chemical, a report on the chemical will have to be filed.

These chemicals were included in the "Missing Production" category.

Impact Estimates

Total cost provides an easily understood gross cost figure for the entire industry. However, as can be seen in Section VI, total cost to the industry varies only slightly with changes in the small business definition, because over 80 percent of the total reporting burden falls to larger firms with sales greater than \$30 million. This insensitivity of the total industry cost to the size of the small business definition can be misleading because providing a small business exemption significantly reduces the reporting burden for firms in the smaller sales categories.

An estimate of the impact on each segment was evaluated by calculating the average reporting cost as a percent of profits.

The formula used to calculate the average impact was:

$$\frac{(\text{Average number of sites} \times \$480) + (\text{Average number of reports} \times \$420)}{\text{Average sales} \times .06}$$

where \$480 is the cost per site, \$420 is the cost per report, and .06 is the profit margin.

IV. UNIT COST ESTIMATES

A. REPORTING BY MANUFACTURERS^{5J}

Before the Preliminary Assessment Information Rule was initially proposed in February of 1980, a limited number of industry interviews were conducted to estimate reporting time and cost. In general, because the respondents were unfamiliar with the Section 8(a) reporting requirements, they had difficulty framing their responses or estimating costs. Thus, an alternative cost estimating procedure was formulated. This approach was to identify a typical process by which a company would gather the required information. The process is described below. On the basis of this process, cost estimates were formulated for the original proposal.

Although the specific reporting requirements have changed between the proposal and the final rule, the process for gathering information did not change. While comments indicated that the costs identified in the proposal were too low because they did not take certain activities into account, changes in the final rule alleviate problems identified by the public. Thus ICF believes that the cost estimates previously published for the proposed rule are reasonable estimates for the final rule. (Figures 9 and 10 in Chapter VII show the sensitivity of the analysis to the cost assumption.)

In estimating reporting costs, emphasis was given to the costs to a firm with annual sales of between \$1 million and \$50 million--the range under consideration for the small business definition. Reporting costs have been divided into fixed costs (e.g., familiarization with the reporting requirements), and variable costs (e.g., estimating off-site use to complete a form for a given chemical). Fully loaded^{6J} costs of personnel are estimated to average as follows:

Senior Officer	\$40 per hour
Attorney	\$40 per hour
Marketing Staff	\$30 per hour
Technical Staff	\$25 per hour
Production Engineer	\$25 per hour
Secretary	\$10 per hour

^{5J}This section is based on work done by Arthur D. Little, Inc. (ADL) under Contract No. 68-01-4717. ICF Incorporated updated ADL's estimates after reviewing available ADL information and assessing the changes in the final form.

^{6J}Fully loaded costs are defined as wages plus fringe benefits.

1. Fixed Costs

The total fixed costs of Preliminary Assessment Information reporting are estimated to be \$480 per production site. Most of the smaller companies would have only one plant site, so the \$480 fixed cost would be the total fixed cost for the company.

Three steps were included in the fixed cost estimate: becoming familiar with the form and the regulations, determining which chemicals are produced, and preparing and reviewing the complete set of forms before submission to the EPA. Because of the publicity surrounding TSCA and the chemical industry's apprehension about how EPA will implement the law, it is assumed that top management and legal staffs of chemical manufacturers will devote more than cursory attention to the Preliminary Assessment Information forms. Thus, we have estimated that senior officers will dedicate at least one hour to familiarizing themselves with the form and deciding who should be involved in "shepherding" it through the company, and one hour reviewing a package of all completed forms to be submitted to EPA. Similarly, we estimate that the corporate attorney (either an employee or outside counsel) will spend two hours becoming familiar with the requirements and two hours reviewing the completed package of forms. The senior officer and the attorney will be concerned with providing a complete response to EPA questions and determining which items are confidential.

We have assumed that the senior officer will delegate most of the work to a person on the technical staff who will need two hours to become familiar with the requirements and decide how best to gather the information, and two hours to review the completed package of forms with the senior officer. Presumably, a technical staff person will take the company's initial section 8(b) Inventory list and check it against the list of 2,000 chemicals for which a report is required under the Preliminary Assessment Information Rule. In addition, he will have to make sure that the plant site has not ceased production of chemicals it listed on the Inventory or commenced production of new chemicals on the list since it submitted its Inventory list. This task is estimated to require two hours of the technical staff person's time. Completing the data common to all forms, xeroxing them, collating the forms when received from the technical staff and then reviewing the complete package at the technical level is estimated to require two hours for the technical staff and four hours for a secretary. The fixed costs are summarized in Table 1.

2. Variable Costs

Variable costs of reporting are estimated to be \$420 per chemical for each plant site (see Table 2). These costs arise from the preparation and reviews of each individual form that must be submitted to EPA. Preparation of each of the two parts of the form is included separately in the variable cost estimate: Part A--answering the questions about on-site use and exposure, and Part B--answering the questions about off-site use and exposure. For on-site

Table 1

ESTIMATED FIXED COST OF REPORTING PER SITE
(Per Company for Most Companies)

<u>Task</u>	<u>Hours</u>	<u>Cost/Hour</u>	<u>Task Cost</u>
A. FAMILIARIZATION			
Managerial Staff	1	\$40	\$ 40
Legal Staff	2	40	80
Technical Staff	2	<u>25</u>	<u>50</u>
			\$170
B. DETERMINE CHEMICALS PRODUCED			
Technical Staff	2	25	<u>50</u>
			50
C. FINAL PREPARATION AND REVIEW OF PACKAGE			
Managerial Staff	1	40	40
Legal Staff	2	40	80
Technical Staff	4	25	100
Secretary	4	10	<u>40</u>
			260
. TOTAL	18		<u>\$480</u>

Source: Arthur D. Little, Inc. 1979 estimates based upon the EPA OPTS Draft Preliminary Assessment Information Rule dated September 10, 1979.

Table 2
VARIABLE COSTS OF REPORTING PER CHEMICAL

<u>Task</u>	<u>Hours</u>	<u>Cost/Hour</u>	<u>Task Cost</u>
Preparation and review of form			
Part A. PLANT SITE USE AND EXPOSURE-RELATED INFORMATION			
Technical Staff	4	\$25	\$100
Production Engineer	2	25	50
			<u>\$150</u>
Part B. OFF-SITE USE AND EXPOSURE-RELATED INFORMATION			
Technical Staff	4	25	100
Production Engineer	2	25	50
Marketing Staff	4	30	120
			<u>270</u>
TOTAL			<u>\$420</u>

Source: Arthur D. Little, Inc. 1979 estimates based upon the EPA OPTS Draft Preliminary Assessment Information Rule dated September 10, 1979.

data, the technical staff person must identify the appropriate production engineer to interview; the engineer must then gather the information required. We estimate that the production engineer would spend two hours on this task and that the technical staff person would spend two hours completing the task and an additional two hours of analysis.

Off-site data is more complicated, but it is likely that many respondents would answer "unknown" when they cannot easily ascertain quantities. The technical staff person would discuss with the production engineer the type of process (enclosed, controlled release, or open) used by customers. Approximately two hours would be required to interview the production engineer about the type of processes customers use, followed by an additional two hours of analysis.

It is estimated that four hours of marketing staff time would be required to analyze sales records to try to determine the off-site data to within 50 percent accuracy. We have assumed that companies reporting would attempt to provide these data rather than answer simply that they do not know.

3. Changes in the Final Form

Both the fixed and variable cost estimates in this report were initially developed based on a draft of the reporting form contained in the February 1980 proposed regulation. Industry commented that the proposed rule's estimated costs per company were too low. This may be true for two general reasons. One reason is that the proposal incorrectly stated that costs were estimated per company; in fact, the costs were estimated per plant site. Thus, the proposal's cost estimates would be low for any company that had more than one plant site with a reporting requirement. However, this error does not affect the cost estimates in the proposal's economic analysis.

The second general reason commenters gave for the proposal's cost estimates being low was that time to perform certain required activities was not included.

For example, industry indicated that substantiating confidentiality claims under the proposed regulation would be complex, difficult, and costly. EPA has changed this part of the regulation so that companies may claim confidentiality simply by signing a statement of certification.

Industry noted that time was not included to compile customer lists; however, the final rule eliminates this provision. Industry also noted that the proposed rule's cost estimates did not include time to identify chemicals listed by category rather than by CAS number and chemical name; lengthy start-up time for reporting by plant sites that manufacture many chemicals; time to re-aggregate data recorded for a fiscal year to a calendar year; and

time to work at both plant site and headquarters. The final rule changes each of these provisions to alleviate the need for extra reporting time.

Because the reporting requirements and the form have been altered to alleviate many of the problems industry brought up, the original cost estimate closely approximates the cost of the final rule.

ICF has analyzed the sensitivity of its economic impact estimates to its unit cost estimates. The results of this analysis, performed by doubling and halving, in turn, the unit cost estimates, appear in Figures 9 and 10 in Chapter VII.

B. REPORTING BY SELECTED PROCESSORS

After EPA reviews and compiles the manufacturers' reports, the Agency may find that manufacturers did not provide sufficient information on customer uses of certain chemicals. If manufacturers reported customer uses as "unknown" for more than 20 percent of the processed quantity of a given chemical, EPA will require processors of the chemical to complete a separate form.

For processors, completing the form should cost approximately \$255 per plant site plus \$100 per chemical per site (see Table 3). To gather the required information, processors will use a procedure similar to the one described for manufacturers. However, it will take less time to complete a processor's form because the form is simpler and no off-site use and exposure information is required.

Cost per site. We have assumed that a senior officer of the plant site, a corporate attorney or outside counsel, and a member of the technical staff will each spend about one hour familiarizing themselves with the form and deciding who should complete it. Then, a member of the technical staff will spend two hours checking the chemicals produced at the site against the list published in Subpart C (712.45) for which reporting is required. Checking and completing the package after the information has been gathered is estimated to take one hour of technical staff time and one hour of secretarial time. A technical staff member will spend an additional one-half hour each reviewing the complete packages with a senior officer and lawyer. As illustrated on Table 3, the total expense for this process will be about \$255.

Cost per chemical per site. Whereas manufacturers must report on both their own uses and customer uses, processors must report only on their own uses. In addition, the information processors must provide is not as detailed. Therefore, we estimate that the form can be completed in a total of about four hours per chemical at a cost of \$100.

Table 3

ESTIMATED COST TO PROCESSORS OF REPORTING

<u>Fixed Cost (Per Site)</u>			
<u>Task</u>	<u>Hours</u>	<u>Cost/Hour</u>	<u>Task Cost</u>
A. FAMILIARIZATION			
Managerial	1	\$40	\$ 40
Legal	1	40	40
Technical Staff	1	25	25
B. DETERMINE CHEMICALS PRODUCED			
Technical Staff	2	25	50
C. FINAL PREPARATION AND REVIEW OF PACKAGE			
Managerial Staff	1/2	40	20
Legal Staff	1/2	40	20
Technical Staff	2	25	50
Secretary	1	10	<u>10</u>
TOTAL COST PER SITE			\$255

<u>Variable Cost (Per Chemical Per Site)</u>			
D. PREPARATION AND REVIEW OF FORM; PLANT SITE USE AND EXPOSURE			
Technical Staff	2	\$25	\$ 50
Production Engineer	2	25	<u>50</u>
TOTAL COST PER CHEMICAL PER SITE			\$100

A technical staff member must identify the appropriate production engineer with whom to discuss the form. This is estimated to take approximately one hour. The production engineer must then gather the required information and fill in the form--a task estimated to take two hours. The technical staff member will then analyze and review the information. Table 3 summarizes this process.

V. ANALYSIS OF OPTIONS FOR SMALL BUSINESS DEFINITION

A. EPA'S POLICY

Section 8(a) of TSCA requires that small manufacturers and processors (as defined by the Administrator) be excluded from the reporting requirements of section 8(a) rules, except in certain circumstances. The Agency's policy in setting a small business definition has been to balance the relative burden of providing information against the need for that information.^{7J}

B. CRITERIA FOR DETERMINING THE DEFINITION OF "SMALL BUSINESS"

In trying to identify criteria to define a company as "small" for the TSCA Inventory, the Agency explored several parameters including company sales, sales per chemical, assets, employment, and number of sites. A study concluded that company sales alone or combined with another parameter are the most reasonable criteria to define "small."^{8J} For the Inventory, small was defined by both sales and production volume. The rationale for choosing these criteria over other possible measures has not changed and therefore the discussion will not be repeated here.

For the present rule, the Agency studied companies with sales from \$0 to \$50 million. Over 90 percent of all chemical firms have sales in this range. However, of firms affected by this rule, fewer than 50 percent have sales in this range because the chemicals this rule covers are primarily high-volume chemicals, produced by larger firms. In this analysis, production volumes is combined with sales in the alternative definitions of "small."

Several factors were examined to determine what the sales and production levels for the definition of "small" should be. These factors included estimated number of firms at each level, number of reports per firm, total costs, and economic impact on the firms measured as a percent of profits (see Tables 4 through 17 in Chapter VI).

^{7J}See Inventory Reporting Regulations 42 FR 64573 (1977), Premanufacture Notification Requirements and Review Procedures, 44 FR 2254 (1979), Submission of Notice of Manufacture or Importation of PBBs and Tris, 44 FR 59107 (1979).

^{8J}See Analysis of Options for Definition of Small Business, and Estimated Cost of the Initial Section 8(a) Reporting Requirement, Arthur D. Little, Incorporated, EPA Report No. 561/1-77-001, November 1977.

C. THE PRODUCTION VOLUME CRITERION

High production volume alone does not indicate significant exposure, but may indicate widespread use and thus the potential for release of significant quantities. Consequently, we examined production limits of 100,000 and 1,000,000 pounds (below which companies would not report) in combination with sales volume in this analysis of the small business definition.

For similar reasons, EPA agreed with industry comments on the proposal that production of an extremely small quantity of a given chemical would be unlikely to pose significant exposure, and thus should not be reported for this rule. In the final rule, no plant site must report on a chemical produced in quantities below 500 kilograms.

D. OPTIONS FOR SMALL BUSINESS DEFINITIONS

The options we examined for the small business definition were various annual sales figures combined with production volume limits. All of the plant sites with parent firms with total annual sales above the sales cutoff of the small business definition are required to report. When its parent firm falls below the sales cutoff of the small business definition, a plant site need only report on a chemical production greater than or equal to the production limit. Fourteen different cases are examined in this report:

Baseline (no small business or small quantity exemption.)

No small business exemption; 500 kilogram small quantity exemption.

\$1 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$3 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$5 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$10 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$30 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$50 Million sales limit and 100,000 pounds production limit; 500 kilogram small quantity exemption.

\$1 Million sales limit and 1,000,000 pounds production limit; 500 kilogram small quantity exemption.

\$3 Million sales limit and 1,000,000 pounds production limit; 500 kilogram small quantity exemption.

\$5 Million sales limit and 1,000,000 pounds production limit; 500 kilogram small quantity exemption.

\$10 Million sales limit and 1,000,000 pounds production limit; 500 kilogram small quantity exemption.

\$30 Million sales limit and 1,000,000 pounds production limit; 500 kilogram small quantity exemption.

\$50 Million sales limit and 1,000,000 pounds production limit; 500 kilogram small quantity exemption.

E. SMALL BUSINESS DEFINITION

To qualify as small with respect to a given chemical under the section 8(a) Preliminary Assessment Rule, a plant site must meet the following criteria:

- a. total annual sales of the parent company (on all products) are less than \$30 million, and
- b. total annual production (or amount processed) of the chemical at the plant site is less than 100,000 pounds.

Annual sales figures are based on the sum of all of the plant sites owned or controlled by the reporting parent company.

The small business exemption is separate from the small quantity exemption. Under the small quantity exemption, reports on chemicals produced in quantities of 500 kg or less per plant site are not required, regardless of company size.

Because a purpose of this rule is to identify general exposure potentials to set EPA's preliminary priorities and assess risks, more detailed information is not needed for this rule. Therefore, a relatively high sales cut-off level has been adopted. However, because another purpose of this rule is to identify potentially high exposures, it is necessary to specify a production limit of 100,000 pounds above which a company would have to report regardless of sales.

Several factors led to the value of \$30 million as a cutoff. First, firms under \$30 million in sales generally have fewer technical staff available to

help meet reporting requirements.^{9J} Second, the vast majority of reports will be filed by companies above the \$30 million level, so that a substantial amount of information will be reported even with a \$30 million cutoff. A small business definition higher than \$30 million would mean that a larger amount of information would be lost. Third, above \$30 million, the estimated median impact as a percent of profits drops below 0.1 percent.

^{9J}SOCMA comments on proposed PMN regulations, March 26, 1979, p. 35.

VI. TOTAL COST AND ECONOMIC IMPACT

A. TOTAL INDUSTRY COSTS

The total cost to industry was determined for 14 small business definitions (see Tables 4 through 17 and summary Table 18). These tables show that the cost to manufacturers, using the assumptions discussed in Section III, could range from \$4.3 to \$5.0 million depending on the exemption criteria selected.

If no small business or small quantity exemptions are allowed, the total cost to manufacturers of the Preliminary Assessment Information Rule will be \$5.0 million (Table 4). Under these conditions, 959 companies representing a total of 1,881 plant sites would be subject to the rule (see Table 4).

With the small business definition set at \$30 million with a production volume limit of 100,000 pounds, the total cost of the Rule to manufacturers is \$4.4 million. Under this definition, 1,717 plant sites representing 820 firms would be subject to the rule (see Table 10). Ninety-one of the firms with sales below \$30 million did not provide production data. These firms may also be exempt from reporting.

The change in total cost between the benchmark cost (no small business definition) and the most lenient definition under consideration (\$50 million and 1,000,000 pounds) does not exceed 16 percent (\$4.3 million versus \$5.0 million). This is partially attributable to the fact that, because of their production volume, some companies will have to report no matter what the size of the dollar sales exemption. It is also due to the fact that if there were no exemptions, plant sites belonging to companies with sales of \$30 million or more will submit over 80 percent of the individual chemical reports. These companies represent only 55 percent of the companies with plant sites required to report for this rule. The 80 percent and 55 percent figures are derived by summing the number of companies over \$30 million on Table 4 and dividing by the total number of companies and reports, not including those with missing production or sales.

B. ECONOMIC IMPACT

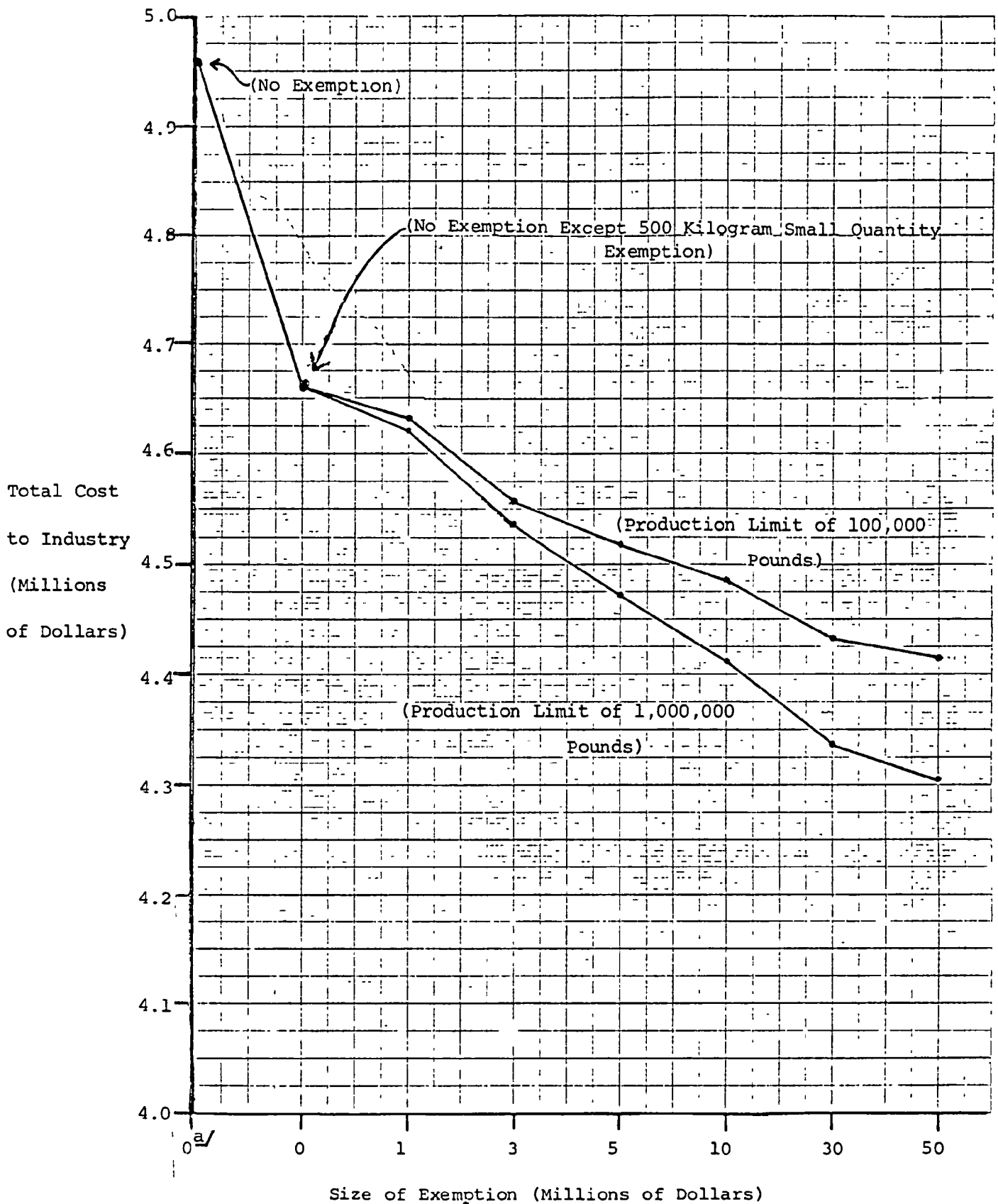
The economic impact of the Preliminary Assessment Information Rule on individual companies varies greatly across sales categories (see Figure 4). The average impact statistics, measured as a percent of company profits, appear in Tables 4 through 17 and summary Table 18.

The total number of firms reporting is only reduced 15 percent by providing a small business exemption. It goes from 959 with no exemptions to 820 with a \$30 million, 100,000 pound exemption (Figure 3). But the number of firms with sales below \$30 million reporting is reduced 64 percent by providing the exemption (see Figure 5). With no small business exemption and a 500 kilogram small quantity exemption, 286 firms under \$30 million must report; with a \$30

million, 100,000 pound exemption, only 103 with sales under \$30 million must report. Of the 183 exempted, however, production data are missing for 91. Some of these may still have to report because of large production volume. This number is not expected to be great, however, as 54 of the 91 are extremely small companies with sales under \$5 million.

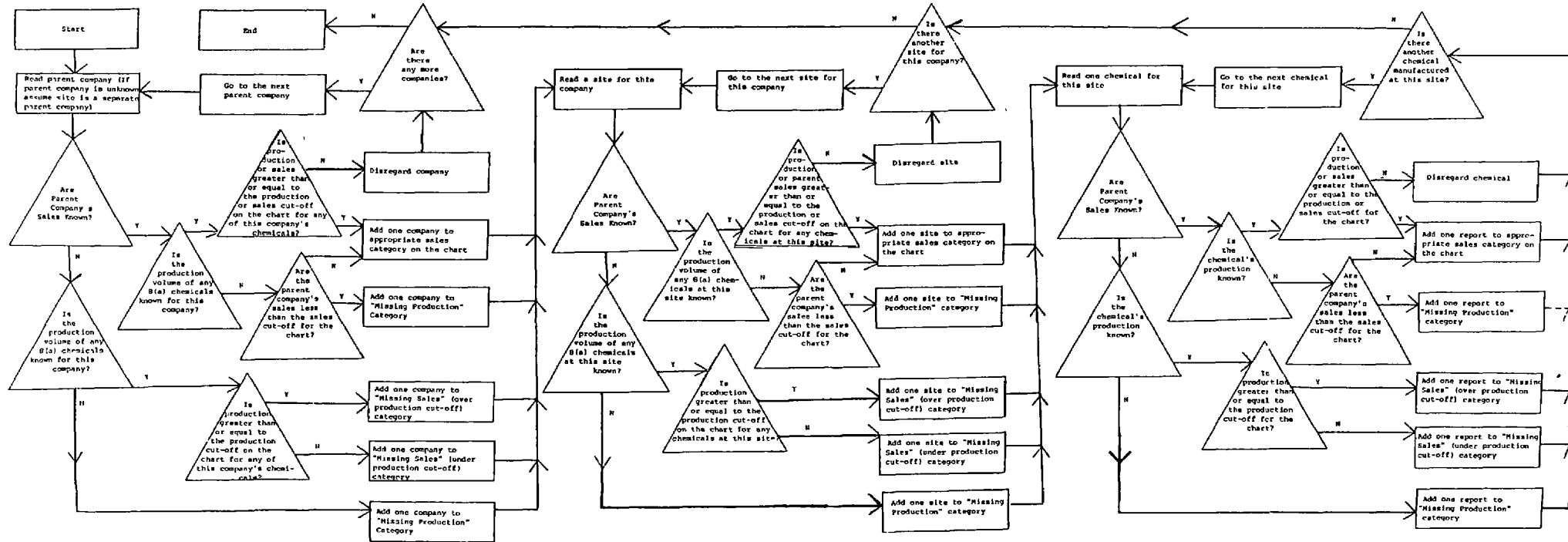
FIGURE 2

TOTAL COST VS. SIZE OF EXEMPTION



a/ No small business exemption or small quantity exemption. For all other sizes of exemption, the 500 kilogram small quantity exemption applies regardless of company size.

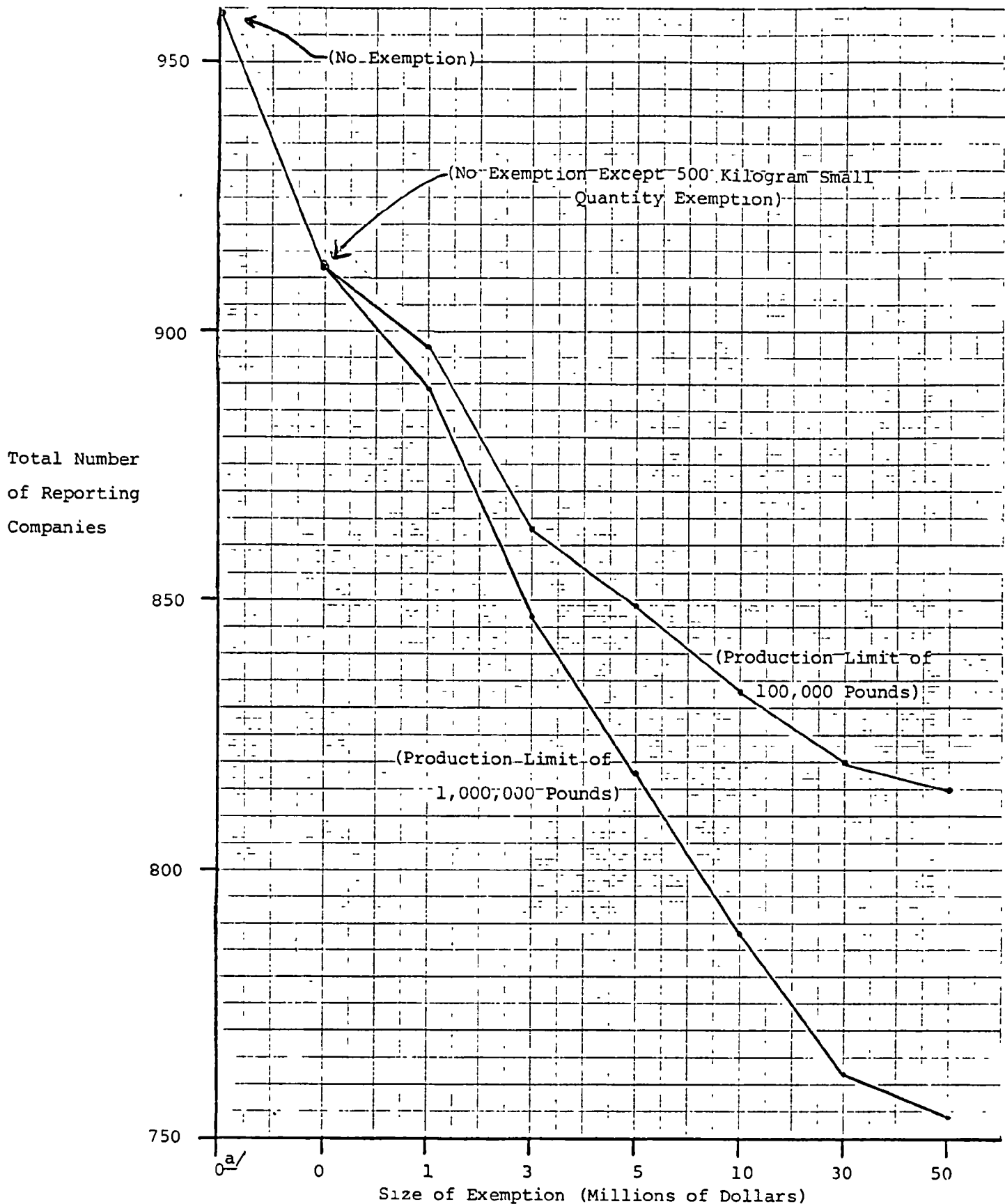
FIGURE 1
FLOW CHART FOR CLASSIFYING DATA



Y -- Yes, N -- No.

FIGURE 3

TOTAL REPORTING COMPANIES VS. SIZE OF EXEMPTION

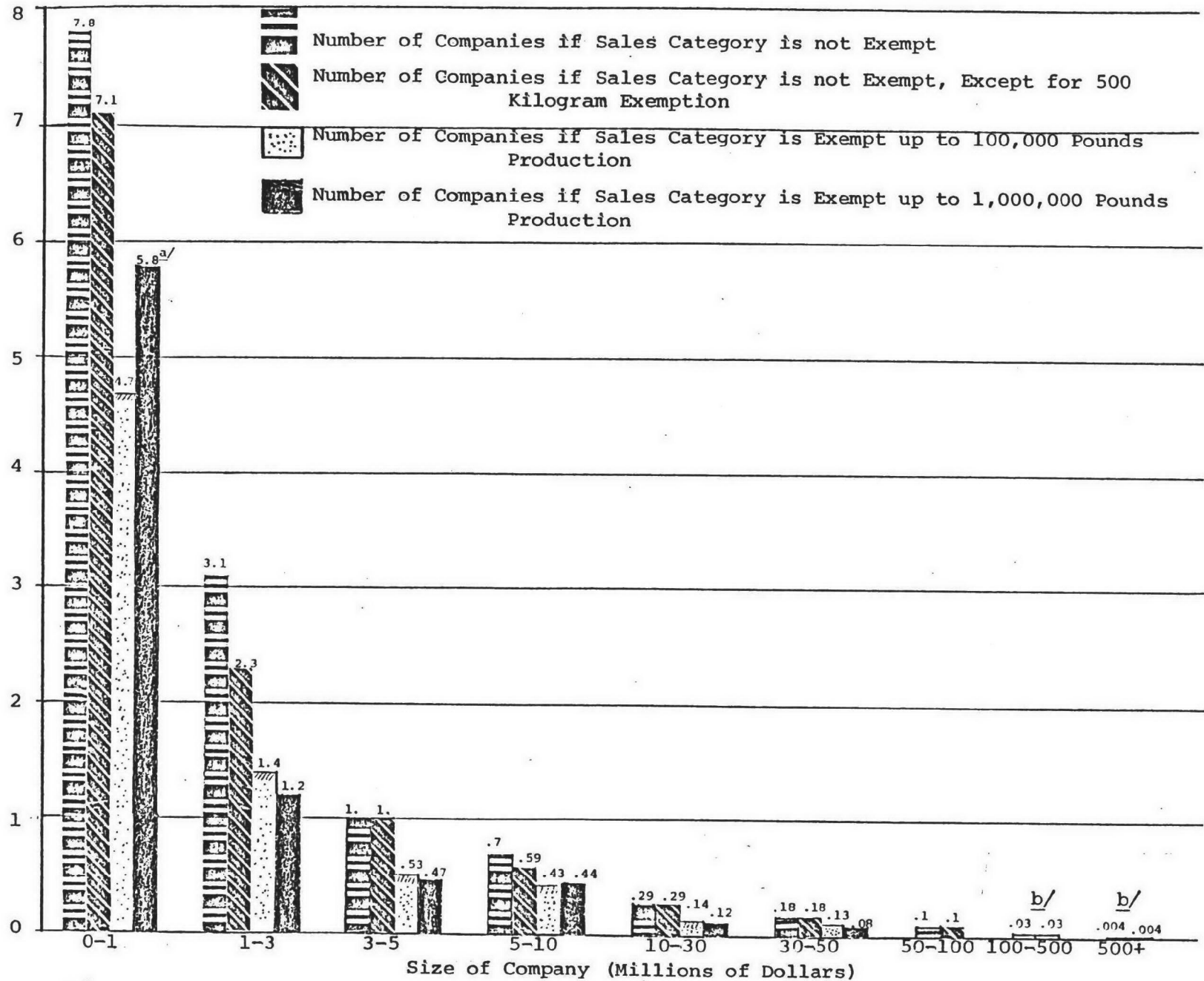


^{a/} No small business exemption or small quantity exemption. For all other sizes of exemption, the 500 kilogram small quantity exemption applies regardless of company size.

FIGURE 4

AVERAGE IMPACT ON A FIRM WHICH MUST REPORT

Average
Impact
(Cost as
Percent
of Profit)

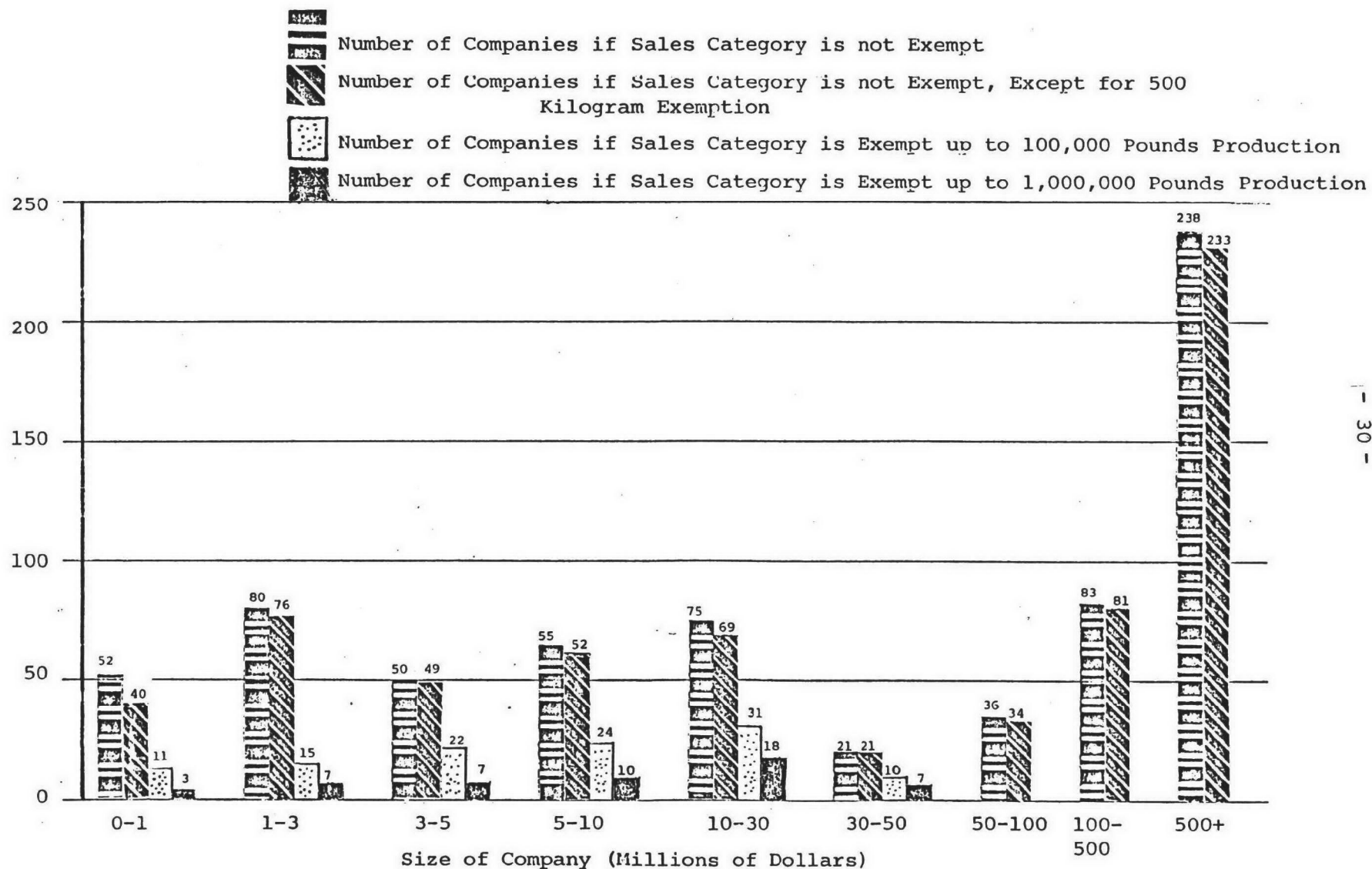


^{a/} Average of only three companies of this size affected under 1,000,000 pound exemption.

^{b/} The two types of companies displayed here are the same as those for size range 50-100.

FIGURE 5

EFFECT OF SMALL BUSINESS EXEMPTION ON NUMBER OF COMPANIES REQUIRED TO REPORT*



*Of the 183 companies exempted by a \$30 million, 100,000 pound small business definition, production data are missing for 91. Some of these may still have to report due to large production volume, but this number is not expected to be great, since 54 of the 91 have sales under \$5 million.

FIGURE 6
IMPACT ON MOST AFFECTED COMPANY IN EACH SALES CATEGORY

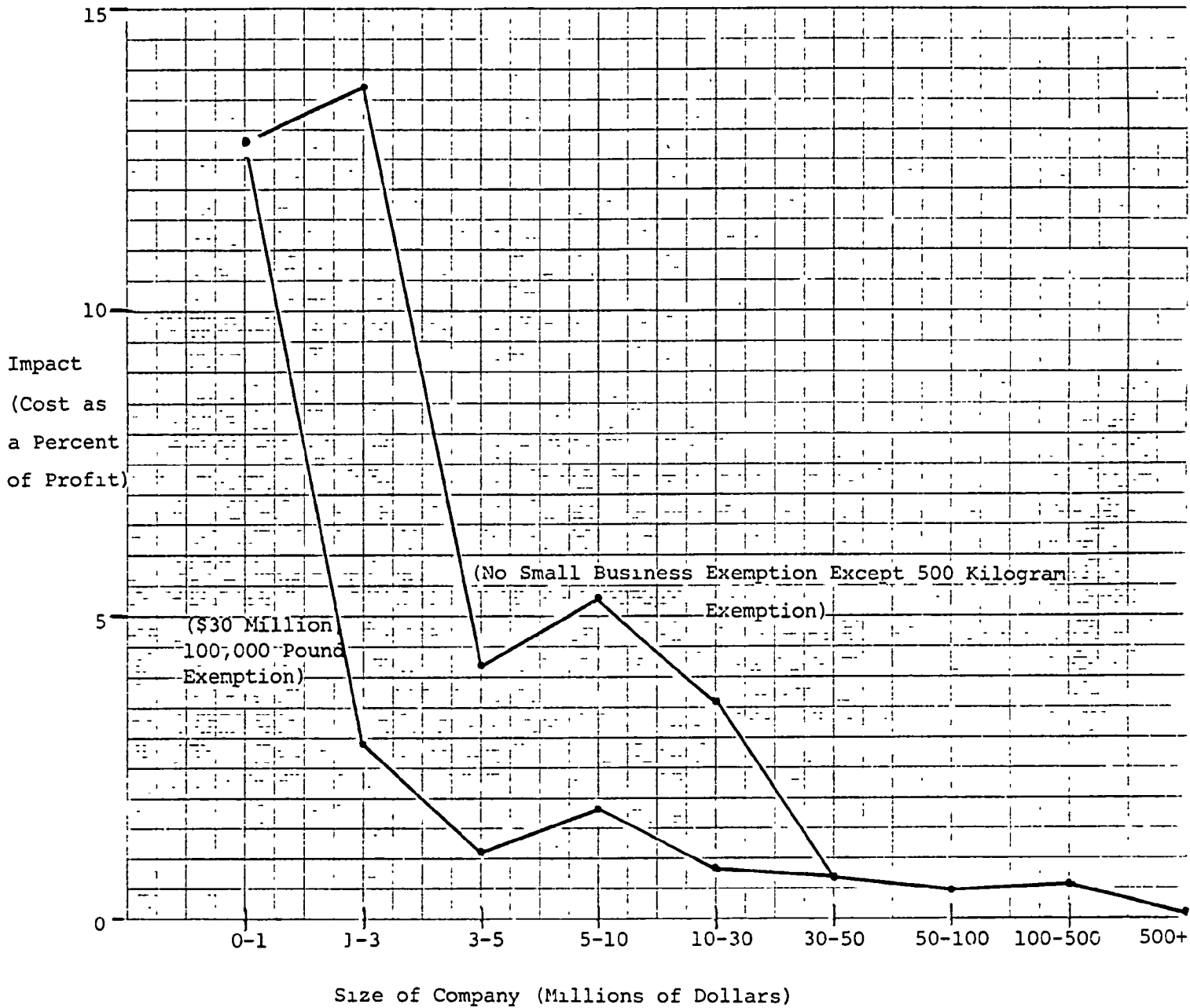


Table 4

BASELINE (NO SMALL BUSINESS EXEMPTION OR SMALL QUANTITY EXEMPTION)

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales	Missing Production	Total
Number of Firms	52	80	50	55	75	21	36	83	238	206	63	959
Number of Plant Sites	56	86	51	62	86	30	50	137	1,035	213	75	1,881
Number of Individual Reports	253	506	222	331	425	168	272	767	5,315	894	503	9,656
Average Number of Reports/Firm	4.87	6.33	4.44	6.02	5.66	8.00	7.56	9.24	22.33	4.34	--	10.07
Range of Number of Reports	1-17	1-70	1-33	1-44	1-49	1-30	1-50	1-92	1-244	--	--	1-244
Total Cost (\$)	33,140	253,800	117,720	168,780	219,780	84,960	138,240	387,900	2,729,100	477,720	247,260	4,958,400
Range of Cost Per Firm (\$)	900- 4,260	900- 14,760	900- 10,140	900- 18,960	900- 21,540	900- 14,040	900- 22,440	900- 39,120	1,320- 45,120	--	--	900- 45,120
Average Impact (as % of Profit) Per Firm	7.8	3.1	1.	.7	.29	.18	.096	.030	.004	--	--	--
Range of Impact (as % of Profit) Per Firm	1.5- 101.6	0.5- 40.2	.3- 4.2	.15- 5.3	.06- 3.6	.04- .69	.02- .46	.0030- .58	0- .08	--	--	--

Table 5

NO SMALL BUSINESS EXEMPTION; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0- 1M	1- 3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales	Missing Production	Total
Number of Cos.	40	76	49	52	69	21	34	81	233	194	63	912
Number of Plant Sites	45	82	50	60	80	29	49	135	1,020	198	75	1,823
Number of Individual Reports	158	348	206	228	381	166	260	626	5,064	862	719	9,018
Average Number of Reports/Co.	4.0	4.6	4.2	4.4	5.5	7.9	7.6	7.7	21.7	--	--	9.89
Range of Number of Reports	1-9	1-34	1-23	1-44	1-49	1-30	1-49	1-135	1-244	--	--	1-244
Total Cost (\$)	87,960	185,520	110,520	124,560	198,420	84,960	132,720	327,720	2,616,480	457,080	337,980	4,662,600
Range of Cost Per Firm (\$)	900- 4,260	900- 14,760	900- 10,140	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 39,120	1,320- 45,120	--	--	900- 116,280
Average Impact (as % of Profit) Per Firm	7.1	2.3	1.0	.59	.29	.18	.10	.030	.004	--	--	--
Range of Impact (as % of Profit) Per Firm	1.6- 12.8	5.23- 13.7	0.3- 4.2	.15- 5.27	.06- 3.6	.04- .69	.02- .46	.003- .58	0- .08	--	--	--

Table 6

SMALL BUSINESS DEFINITION: \$1 MILLION SALES LIMIT AND 100,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	11	76	49	52	69	21	34	81	233	155	39	77	897
Number of Plant Sites	11	82	50	60	80	29	49	135	1,020	157	41	90	1,804
Number of Individual Reports	24	348	206	228	381	166	260	626	5,064	537	325	800	8,965
Average Number of Reports/Co.	2.18	4.6	4.2	4.4	5.5	7.9	7.6	7.7	21.7	--	--	--	9.99
Range of Number of Reports	1-8	1-34	1-23	1-44	1-49	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	15,360	185,520	110,520	124,560	198,420	83,640	132,720	327,720	2,616,480	300,900	156,180	379,200	4,631,220
Range of Cost Per Firm (\$)	900- 3,840	900- 14,760	900- 10,140	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Profit) Per Firm	4.7	2.3	1.0	.59	.29	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Profit) Per Firm	1.9- 12.8	0.3- 13.7	0.3- 5.3	.15- 5.3	.06- 3.6	.04- .69	.02- .46	.003- .58	0- .08	--	--	--	--

Table 7

SMALL BUSINESS DEFINITION: \$3 MILLION SALES LIMIT AND 100,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	11	15	49	52	69	21	34	81	233	155	39	104	863
Number of Plant Sites	11	15	50	60	80	29	49	135	1,020	157	41	118	1,765
Number of Individual Reports	24	42	206	228	381	166	260	626	5,064	537	325	976	8,835
Average Number of Reports/Co.	2.18	2.80	4.2	4.4	5.5	7.9	7.6	7.7	21.7	--	--	--	10.24
Range of Number of Reports	1-8	1-7	1-23	1-44	1-49	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	15,360	24,840	110,520	124,560	198,420	83,640	132,720	327,720	2,616,480	300,900	156,180	466,560	4,557,900
Range of Cost Per Firm (\$)	900- 3,840	900- 3,420	900- 10,140	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	4.7	1.4	1.0	.59	.29	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	1.- 12.8	.6- 2.85	0.3- 4.2	.15- 5.3	.06- 3.6	.04- .69	.02- .46	.003- .652	0- .08	--	--	--	--

Table 8

SMALL BUSINESS DEFINITION: \$5 MILLION SALES LIMIT AND 100,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	11	15	22	52	69	21	34	81	233	155	39	117	849
Number of Plant Sites	11	15	22	60	80	29	49	135	1,020	157	41	132	1,751
Number of Individual Reports	24	42	40	228	381	166	260	626	5,064	537	324	1,063	8,756
Average Number of Reports/Co.	2.18	2.80	1.82	4.4	5.5	7.9	7.6	7.7	21.7	--	--	--	10.31
Range of Number of Reports	1-8	1-7	1-5	1-44	1-49	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	15,360	24,840	27,360	124,560	198,420	83,640	132,720	327,720	2,616,480	300,900	156,180	509,820	4,518,000
Range of Cost Per Firm (\$)	900- 3,840	900- 3,420	900- 2,580	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	4.7	1.4	.53	.59	.29	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	1.9- 12.8	.64- 2.85	.38- 1.05	.15- 5.3	.06- 3.6	.04- .69	.02- .46	.003- .652	0- .08	--	--	--	--

Table 9

SMALL BUSINESS DEFINITION: \$10 MILLION SALES LIMIT AND 100,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	11	15	22	24	69	21	34	81	233	155	39	129	833
Number of Plant Sites	11	15	22	27	80	29	49	135	1,020	157	41	146	1,732
Number of Individual Reports	24	42	40	67	381	166	260	626	5,064	537	325	1,157	8,689
Average Number of Reports/Co.	2.18	2.80	1.82	2.79	5.5	7.9	7.6	7.7	21.7	--	--	--	10.43
Range of Number of Reports	1-8	1-7	1-5	1-22	1-49	1-30	1-49	1-135	2-244	--	--	--	1-244
Total Cost (\$)	15,360	24,840	27,360	41,100	198,420	83,640	132,720	327,720	2,616,480	300,900	156,180	556,020	4,480,740
Range of Cost Per Firm (\$)	900- 3,840	900- 3,420	900- 2,580	900- 9,720	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	4.7	1.4	.53	.43	.29	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	1.9- 12.8	.64- 2.85	.375- 1.05	.16- 1.76	.06- 3.6	.043- .69	.02- .46	.003- .58	0- .08	--	--	--	--

Table 10

SMALL BUSINESS DEFINITIONS: \$30 MILLION SALES LIMIT AND 100,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	11	15	22	24	31	21	34	81	233	155	39	154	820
Number of Plant Sites	11	15	22	27	33	29	49	135	1,020	157	41	178	1,717
Number of Individual Reports	24	42	40	67	70	166	260	626	5,064	537	325	1,368	8,589
Average Number of Reports/Co.	2.18	2.80	1.82	2.79	2.26	7.9	7.6	7.7	21.7	--	--	--	10.47
Range of Number of Reports	1-8	1-7	1-5	1-22	1-11	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	15,360	24,840	27,360	41,100	45,240	83,640	132,720	327,720	2,616,480	300,900	156,180	660,000	4,431,540
Range of Cost Per Firm (\$)	900- 3,840	900- 3,420	900- 2,580	900- 9,720	900- 5,100	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	4.7	1.4	.53	.43	.14	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	1.9- 12.8	.64- 2.85	.375- 1.05	.16- 1.76	.05- .85	.04- .69	.02- .46	.003- .582	0- .08	--	--	--	--

Table 11

SMALL BUSINESS DEFINITION: \$50 MILLION SALES LIMIT AND 100,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	11	15	22	24	31	10	34	81	233	155	39	160	815
Number of Plant Sites	11	15	22	27	33	14	49	135	1,020	157	41	189	1,713
Number of Individual Reports	24	42	40	67	70	50	260	626	5,064	537	325	1,448	8,553
Average Number of Reports/Co.	2.18	2.80	1.82	2.79	2.26	5.00	7.6	7.7	21.7	--	--	--	10.49
Range of Number of Reports	1-8	1-7	1-5	1-22	1-11	1-21	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	15,360	24,840	27,360	41,100	45,240	27,720	132,720	327,720	2,616,480	300,900	156,180	698,880	4,414,500
Range of Cost Per Firm (\$)	900- 3,840	900- 3,420	900- 2,580	900- 9,720	900- 5,100	900- 10,260	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	4.7	1.4	.53	.43	.14	.13	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	1.9- 12.8	.64- 2.85	.375- 1.05	.16- 1.76	.05- .85	.043- .35	.02- .46	.003- .58	0- .08	--	--	--	--

Table 12

SMALL BUSINESS DEFINITION: \$1 MILLION SALES LIMIT AND 1,000,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	3	76	49	52	69	21	34	81	233	105	89	77	889
Number of Plant Sites	3	82	50	60	80	29	49	135	1,020	105	93	90	1,796
Number of Individual Reports	8	348	206	228	381	166	260	626	5,064	271	591	800	8,949
Average Number of Reports/Co.	2.7	4.60	4.20	4.40	5.50	7.90	7.60	7.70	21.70	--	--	--	10.07
Range of Number of Reports	1-6	1-34	1-23	1-44	1-49	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	4,800	185,520	110,520	124,560	198,420	83,640	132,720	327,720	2,616,480	164,220	292,860	379,200	4,620,660
Range of Cost Per Firm (\$)	900- 3,000	900- 14,760	900- 10,140	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	5.8	2.3	1.0	.59	.29	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	2.6- 10.0	0.5- 13.7	0.3- 4.20	.15- 5.30	.06- 3.60	.04- .69	.02- .46	.003- .58	0- .08	--	--	--	--

Table 13

SMALL BUSINESS DEFINITION: \$3 MILLION SALES LIMIT AND 1,000,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	3	7	49	52	69	21	34	81	233	105	89	104	847
Number of Plant Sites	3	7	50	60	80	29	49	135	1,020	105	93	118	1,749
Number of Individual Reports	8	14	206	228	381	166	260	626	5,064	271	591	976	8,791
Average Number of Reports/Co.	2.7	2.00	4.20	4.40	5.50	7.90	7.6	7.70	21.7	--	--	--	10.38
Range of Number of Reports	1-6	1-3	1-23	1-44	1-49	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	4,800	9,240	110,520	124,560	198,420	83,640	132,720	327,720	2,616,480	164,220	292,860	466,560	4,531,740
Range of Cost Per Firm (\$)	900- 3,000	900- 1,740	900- 10,140	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	5.8	1.2	1.0	.59	.29	.18	.10	0.03	0.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	2.6- 10.0	.75- 1.04	0.3- 4.20	.15- 5.30	.06- 3.60	.04- .69	.02- .46	0.003- .58	0.00- .08	--	--	--	--

Table 14

SMALL BUSINESS DEFINITION: \$5 MILLION SALES LIMIT AND 1,000,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	3	7	7	52	69	21	34	81	233	105	89	117	818
Number of Plant Sites	3	7	7	60	80	29	49	135	1,020	105	93	132	1,720
Number of Individual Reports	8	14	10	228	381	166	260	626	5,064	271	591	1,063	8,682
Average Number of Reports/Firm	2.7	2.00	1.43	4.40	5.50	7.90	7.60	7.70	21.7	--	--	--	10.61
Range of Number of Reports	1-6	1-3	1-3	1-44	1-49	1-30	1-49	1-135	1-244	--	--	--	2-244
Total Cost (\$)	4,800	9,240	7,560	124,560	198,420	83,640	132,720	327,720	2,616,480	164,220	292,860	509,820	4,472,040
Range of Cost Per Firm (\$)	900- 3,000	900- 1,740	900- 1,740	900- 18,960	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	5.8	1.2	.47	.59	.29	.18	.10	0.03	0.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	2.6- 10.0	.75- 1.04	.336- .725	.15- 5.3	0.06- 3.60	.04- .69	.02- .46	0.003- .58	0.00- 0.08	--	--	--	--

Table 15

SMALL BUSINESS DEFINITION: \$10 MILLION SALES LIMIT AND 1,000,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	3	7	7	10	69	21	34	81	233	105	89	129	788
Number of Plant Sites	3	7	7	11	80	29	49	135	1,020	105	93	146	1,685
Number of Individual Reports	8	14	10	32	381	166	260	626	5,064	271	591	1,157	8,580
Average Number of Reports/Co.	2.7	2.00	1.43	3.20	5.50	7.90	7.60	7.70	21.7	--	--	--	10.89
Range of Number of Reports	1-16	1-3	1-3	1-16	1-49	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	4,800	9,240	7,560	18,720	198,420	83,640	132,720	327,720	2,616,480	164,220	292,860	556,020	4,412,400
Range of Cost Per Firm (\$)	900- 3,000	900- 1,740	900- 1,740	900- 7,200	900- 21,540	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	5.8	1.2	.47	.44	.29	.18	.10	.030	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	2.61- 10.0	.75- 1.04	.336- .725	.19- 1.3	.065- 3.59	.04- .69	.02- .46	.003- .58	0- 0.08	--	--	--	--

Table 16

SMALL BUSINESS DEFINITION: \$30 MILLION SALES LIMIT AND 1,000,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	3	7	7	10	18	21	34	81	233	105	89	154	762
Number of Plant Sites	3	7	7	11	18	29	49	135	1,020	105	93	178	1,655
Number of Individual Reports	8	14	10	32	26	166	260	626	5,064	271	591	1,368	8,436
Average Number of Reports/Co.	2.7	2.00	1.43	3.20	1.44	7.90	7.60	7.70	21.7	--	--	--	11.07
Range of Number of Reports	1-6	1-3	1-3	1-16	1-6	1-30	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	4,800	9,240	7,560	18,720	19,560	83,640	132,720	327,720	2,616,480	164,220	292,860	660,000	4,337,520
Range of Cost Per Firm (\$)	900- 3,000	900- 1,740	900- 1,740	900- 7,200	900- 3,000	900- 14,040	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Prof- it) Per Firm	5.8	1.2	.47	.44	.12	.18	.10	.03	.004	--	--	--	--
Range of Impact (as % of Prof- it) Per Firm	2.6- 10.0	.75- 1.04	.336- .725	.19- 1.3	.06- .5	.04- .69	.02- .46	.003- .58	0- .08	--	--	--	--

Table 17

SMALL BUSINESS DEFINITION: \$50 MILLION SALES LIMIT AND 1,000,000 POUNDS PRODUCTION LIMIT; 500 KILOGRAM SMALL QUANTITY EXEMPTION

	0-1M	1-3M	3-5M	5-10M	10-30M	30-50M	50-100M	100-500M	500+M	Missing Sales (Over 100,000 lbs.)	Missing Sales (Under 100,000 lbs.)	Missing Production	Total
Number of Cos.	3	7	7	10	18	7	34	81	233	105	89	160	754
Number of Plant Sites	3	7	7	11	18	9	49	135	1,020	105	93	189	1,646
Number of Individual Reports	8	14	10	32	26	19	260	626	5,064	271	591	1,448	8,369
Average Number of Reports/Co.	2.7	2.00	1.43	3.20	1.44	2.71	7.60	7.70	12.7	--	--	--	11.10
Range of Number of Reports	1-6	1-3	1-3	1-16	1-6	1-5	1-49	1-135	1-244	--	--	--	1-244
Total Cost (\$)	4,800	9,240	7,560	18,720	19,560	12,300	132,720	327,720	2,616,480	164,220	292,860	698,880	4,305,060
Range of Total Cost (\$)	900- 3,000	900- 1,740	900- 1,740	900- 7,200	900- 3,000	900- 2,580	900- 22,020	900- 59,100	1,320- 116,280	--	--	--	900- 116,280
Average Impact (as % of Profit)	5.8	1.2	0.47	.44	.12	.08	.10	.03	.004	--	--	--	--
Range of Impact (as % of Profit)	2.6- 18.0	.75- 1.04	.336- .725	.19- 1.3	.06- .5	.03- .11	.02- .46	.003- .58	0- .08	--	--	--	--

Table 18
SUMMARY OF TOXIC COSTS
UNDER VARIOUS SMALL BUSINESS DEFINITIONS

EXEMPTION SIZE

	None	None (except 500 kilo- gram exemp- tion)	\$1M - 100K lbs	\$3M - 100K lbs.	\$5M - 100K lbs.	\$10M - 100K lbs.	\$30M - 100K lbs.	\$50M - 100K lbs.	\$1M - 1,000K lbs.	\$3M - 1,000K lbs.	\$5M - 1,000K lbs.	\$10M - 1,000K lbs.	\$30M - 1,000K lbs.	\$50M - 1,000K lbs.
Total Number of Re- port- ing Com- panies	959	912	897	863	849	833	820	815	889	847	818	788	762	754
Total of Re- port- ing Plants	1,881	1,823	1,804	1,765	1,751	1,732	1,717	1,713	1,796	1,749	1,720	1,685	1,655	1,646
Total of Re- ports	9,656	9,018	8,965	8,835	8,756	8,689	8,589	8,553	8,949	8,791	8,682	8,580	8,436	8,369
Total Cost (1,000s)	4,958.4	4,662.6	4,631.2	4,557.9	4,518	4,480.7	4,431.5	4,414.5	4,620.7	4,531.7	4,472	4,412.4	4,337.5	4,305.1

COMPANY SIZE

	\$0-1M	\$1-3M	\$3-5M	\$5-10M	\$10-30M	\$30-50M	\$50-100M	\$100-500M	\$500+M
Average Impact (Cost as percent of profit)									
With no exemptions except 500 kilogram exemption-- Table 5	7.1	2.3	1.0	.59	.29	.18	.10	.03	.004
With \$30 million, 100,000/ lb. exemption--Table 10	4.7	1.4	.53	.43	.14	.18	.10	.03	.004
Most affected company (Cost as percent of profit)									
With no exemptions except 500 kilogram exemption - Table 5	12.8	13.7	4.2	5.3	3.6	.69	.46	.58	.08
With \$30 million, 100,000/ lb. exemption From Table 10	12.8	2.9	1.1	1.8	.85	.69	.46	.58	.08

VII. SENSITIVITY ANALYSIS

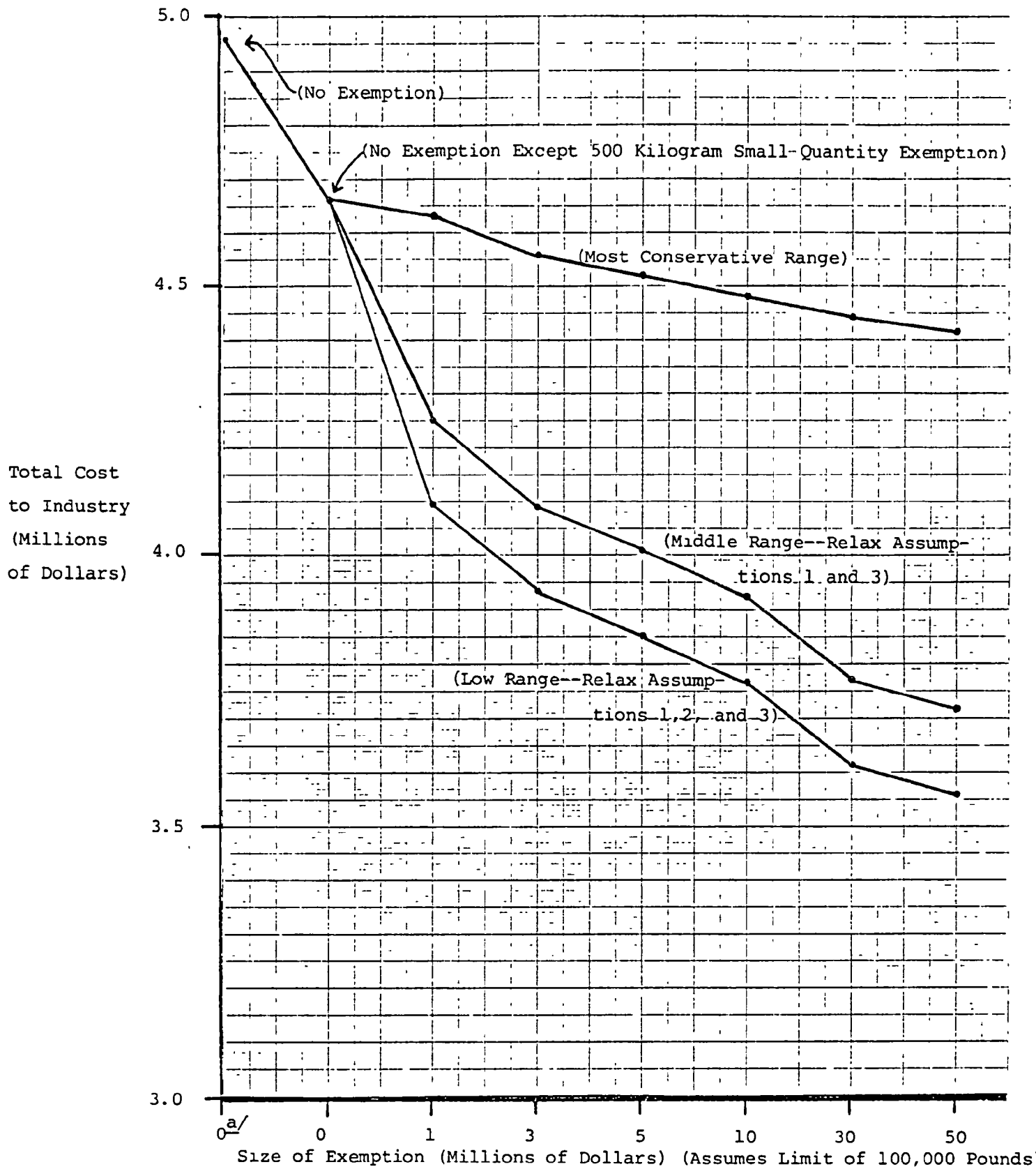
We performed a sensitivity analysis to determine the possible error introduced by the three missing-data assumptions discussed in Section III. We progressively relaxed the assumptions to determine the cost range for the six small business definitions which assume a 100,000 pound production limit. These cases will provide a narrow range in which the true cost of the Rule will be found. The results are summarized in Figure 7.

The "middle range" estimates are found by relaxing assumptions 1 and 3. Assumption 1 states that if the production volume information is unknown for a company which qualifies for an exemption based on sales, the firm would have to report. Assumption 3 states that if production and sales data are both missing, the firm would have to report. (Assumptions 1 and 3 must be relaxed simultaneously, because firms with missing sales and production were classified together with "Missing Production" firms.) In relaxing assumptions 1 and 3, the opposite assumptions were made: firms whose production volume was unknown and who qualify for an exemption based on sales, or whose production and sales were both unknown, were now counted as not having to report unless there is no small business exemption. These estimates are calculated by subtracting the total cost estimate for the "Missing Production" category from the total industry cost estimate shown in the last column of Tables 4-17. Table 19 shows these "middle range" estimates for small business definitions of \$1 million, \$3 million, \$5 million, \$10 million, \$30 million, and \$50 million. Changing only this assumption, the total cost of the Preliminary Assessment Information Rule ranges from \$3,715,620 when the small business definition is set at \$50 million to \$4,958,400 with no small business exclusion.

The "lower bound" estimates are calculated by relaxing assumptions 1, 2 and 3 simultaneously. Under assumption 2, all companies for which annual sales figures were unavailable were assumed to have to report even if they produced chemicals in quantities under 100,000 lbs. In relaxing assumption 2, the opposite assumption was made: all firms for which annual sales figures were unavailable, but which produce chemicals in quantities under 100,000 lbs, were assumed not to report. Relaxing both assumptions means that total cost in the "Missing Production" and "Missing Sales (Under 100,000 lbs.)" categories would fall to zero (unless there is no small business exemption, in which case all companies must report). Therefore, the cost estimate for the "Missing Production" and "Missing Sales (Under 100,000 lbs.)" categories in Tables 4 through 17 is subtracted from the total. Table 20 shows these "lower bound" ranges for the \$1 million, \$3 million, \$5 million, \$10 million, \$30 million, and \$50 million small business definitions. The total cost of the Preliminary Assessment Information Rule with both assumptions relaxed ranges from \$3,559,440 when the small business definition is set at \$50 million to \$4,958,400 when no small business exclusions are allowed. The assumptions

FIGURE 7

EFFECT OF MISSING DATA ASSUMPTIONS



^{a/} No small business exemption or small quantity exemption. For all other sizes of exemption, the 500 kilogram small quantity exemption applies regardless of company size.

Table 19

"MIDDLE RANGE" COST ESTIMATES^{a/}
FOR INVENTORY-TYPE SMALL BUSINESS DEFINITION

<u>Small Business Definition</u>	<u>Middle Range</u>
Baseline-no exemptions	\$4,958,400
\$0 Million (with 500 kg exemption)	\$4,662,600
\$1 Million (with 500 kg exemption)	\$4,252,020
\$3 Million (with 500 kg exemption)	\$4,091,340
\$5 Million (with 500 kg exemption)	\$4,008,180
\$10 Million (with 500 kg exemption)	\$3,924,680
\$30 Million (with 500 kg exemption)	\$3,771,500
\$50 Million (with 500 kg exemption)	\$3,715,620

^{a/}Total industry cost assuming firms whose production volume information was unknown do not have to report. Production volume limit is 100,000 pounds.

Table 20

"LOWER BOUND" COST ESTIMATES^{a/}
FOR INVENTORY-TYPE SMALL BUSINESS DEFINITION

<u>Small Business Definition</u>	<u>Lower Range</u>
Baseline-no exemptions	\$4,958,400
\$0 Million (with 500 kg exemption)	\$4,662,600
\$1 Million (with 500 kg exemption)	\$4,095,840
\$3 Million (with 500 kg exemption)	\$3,935,160
\$5 Million (with 500 kg exemption)	\$3,852,000
\$10 Million (with 500 kg exemption)	\$3,768,500
\$30 Million (with 500 kg exemption)	\$3,615,320
\$50 Million (with 500 kg exemption)	\$3,559,440

^{a/}Total industry cost assuming firms whose production volume information was unknown or whose sales volume for chemicals under 100,000 pounds do not have to report. Production volume is 100,000 pounds.

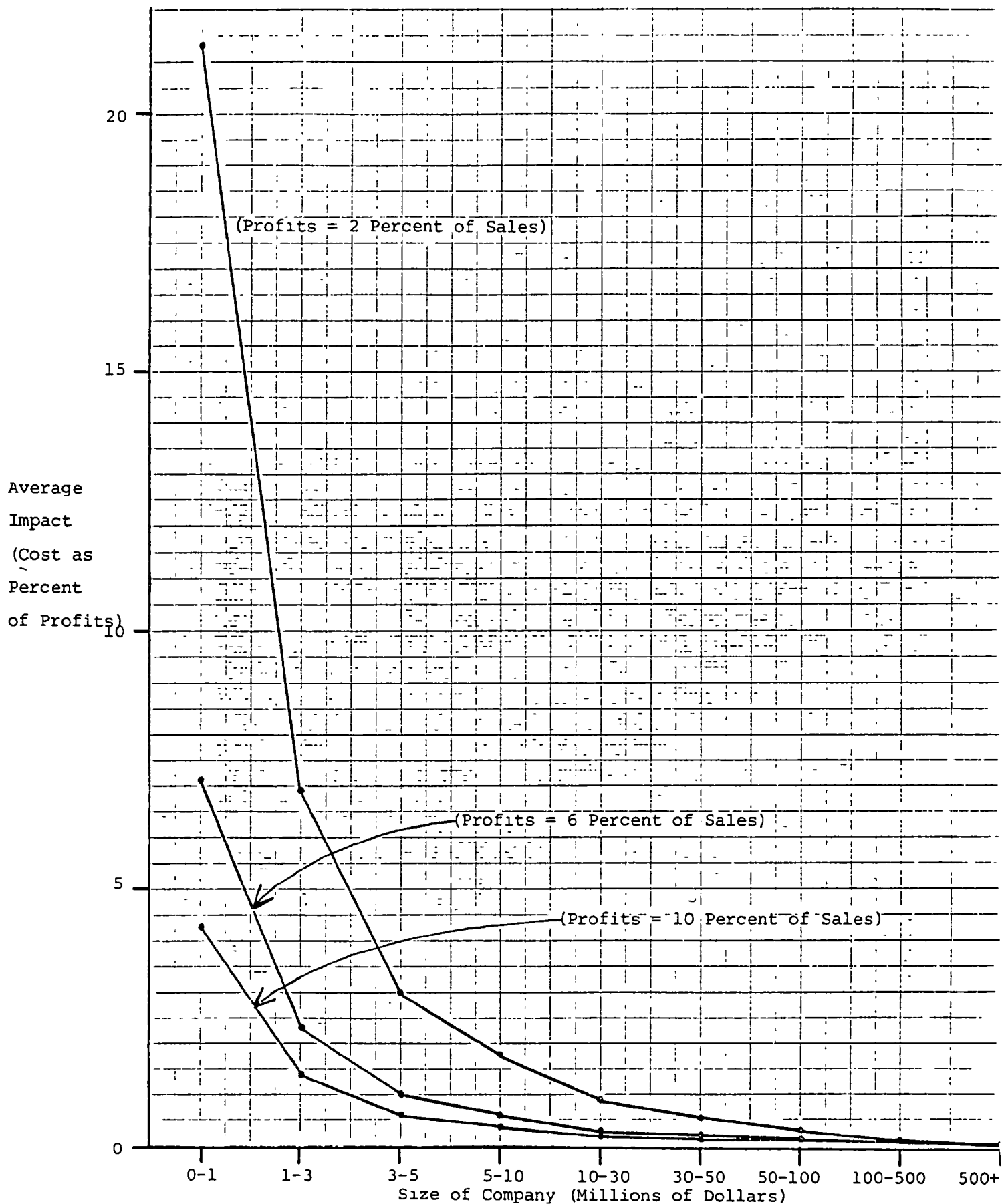
are not relaxed in the no-exemption case, because all firms would have to report on all chemicals.

Relaxing both assumptions changes the total cost of the rule less than 20 percent. The cost and impact of the rule are more sensitive to possible errors in the industry profitability assumption and the unit cost estimate. A firm which is only half as profitable as the assumed six percent of sales would be doubly affected by the rule. Similarly, a firm which spends twice as much time as forecasted to fill out the form would be doubly affected. The impact on firms over \$30 million in sales would still be negligible, however. Figures 8, 9, and 10 demonstrate this effect.

Chemicals listed on the inventory as having no production in 1977 were assumed to still have no production and thus no reporting requirements. If production of these chemicals at these sites has resumed, 69 sites producing 790 chemicals would be affected. The cost of reporting on these sites for these chemicals would be \$713,540.

FIGURE 8

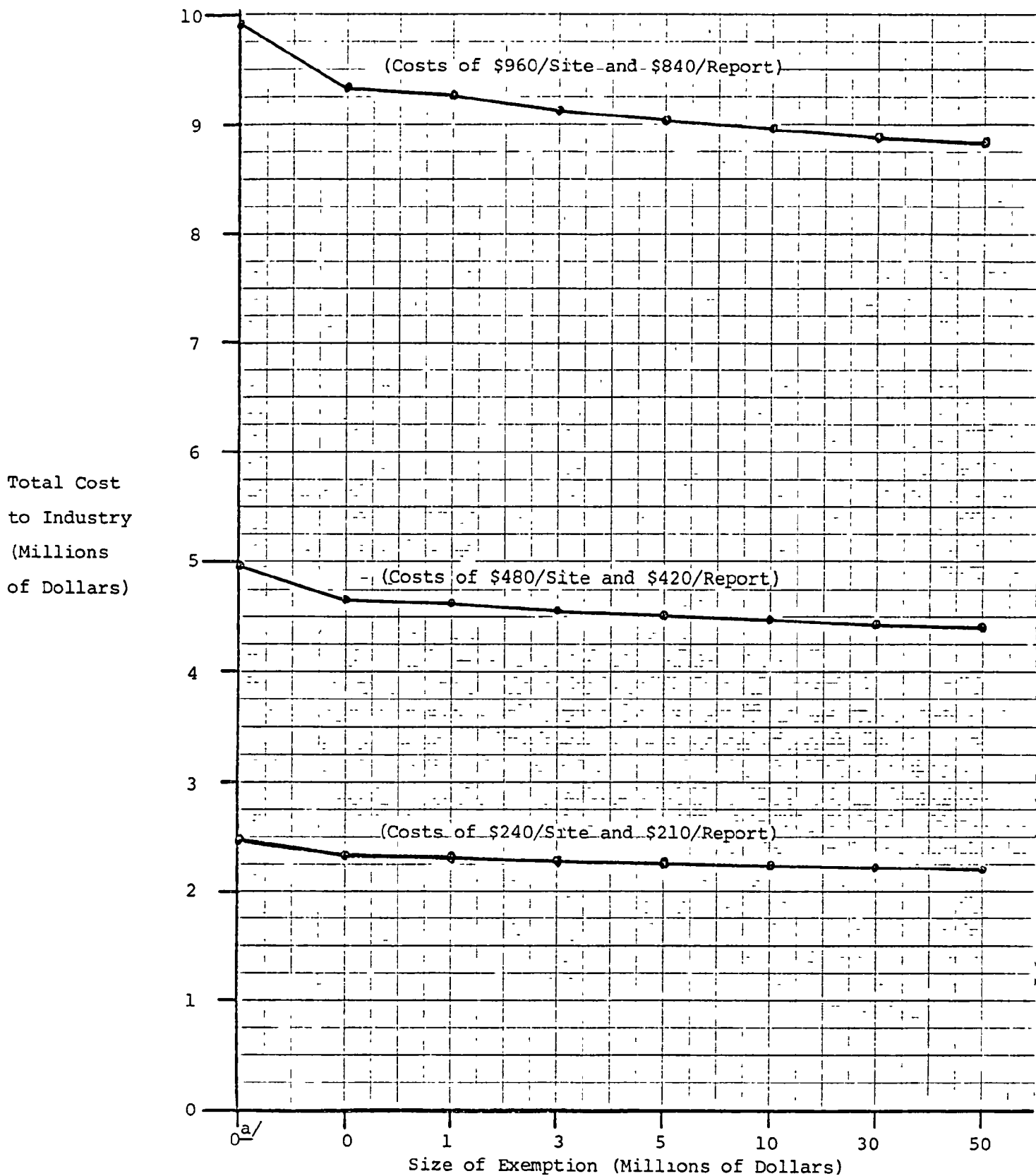
EFFECT OF PROFIT ASSUMPTION ON AVERAGE IMPACT*



* Assumes no small business exemption except the 500 kilogram exemption. Chemical industry profits as a percent of sales have fallen between 2 and 10 percent in each of the last 20 years.

FIGURE 9

EFFECT OF COST ASSUMPTION ON TOTAL COSTS*

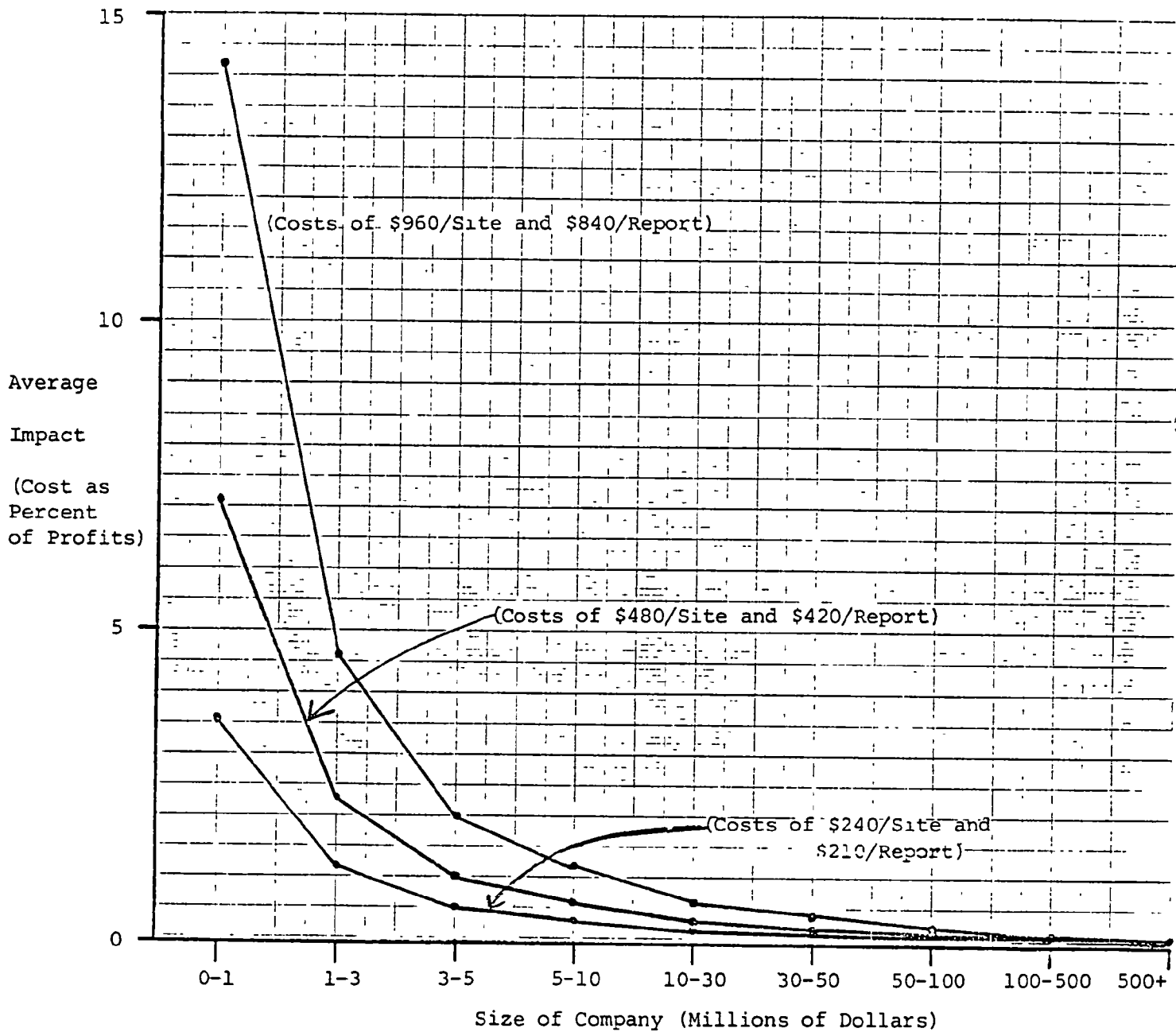


*Assumes limit of 100,000 pounds. This figure doubles and halves our unit cost estimates in turn, to show the sensitivity of total industry costs to these estimates.

^{a/} No small business exemption or small quantity exemption. For all other sizes of exemption, the 500 kilogram small quantity exemption applies regardless of company size.

FIGURE 10

EFFECT OF COST ASSUMPTION ON AVERAGE IMPACT*



*Assumes no small business exemption except 500 kilogram exemption.