

# Integrating EJ into Federal Policies and Programs

*Examining the Role of Regulatory  
Impact Analyses and Environmental  
Impact Statements*

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## **Abstract**

Following Executive Order 12898 in 1994, federal agencies have taken a variety of steps to incorporate environmental justice (EJ) into their programs and practices. Two scales at which these efforts are critical are regulatory design and enforcement. This study evaluates Regulatory Impact Analyses (RIAs) and Environmental Impact Statements (EISs) across three federal agencies (the Department of Energy, the Department of Transportation, and the Environmental Protection Agency) to compare the extent to which EJ is addressed at these two scales, across agencies, and over time. By searching agency documents for key EJ variables, such as site, population, and impact characteristics, we develop a framework to determine if RIAs and EISs include sufficient information to identify disproportionate impacts of proposed regulations or projects on minority and low-income communities. Results of this analysis reveal that EJ issues are noted more frequently in all three agencies' EISs over time, but few RIAs or EISs contain enough data to assess whether EJ impacts are significant.

**Key Words:** environmental justice, Regulatory Impact Analysis, RIA, Environmental Impact Statement, EIS, content analysis, program evaluation

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## **1. Introduction**

Environmental justice (EJ) has become an increasingly important element of emerging climate, energy, and environmental policy debates. Recent efforts in California to establish a cap-and-trade system for reducing carbon emissions have spurred serious opposition from various organizations and communities concerned about potentially disproportionate negative impacts on minority and low-income residents of the state (Kaswan, 2008; Vandenbergh & Ackerly, 2007). These same issues have also gained prominence at the federal level; however, most EJ research to date has focused on identifying and verifying if and to what extent disproportionate costs or benefits exist in different contexts (Ringquist, 2005; Shapiro, 2005). In contrast, there has been limited attention to evaluating the effectiveness of existing government mandates and programs intended to address EJ concerns (Coates, Heid, & Munger, 1994; Konisky, 2007; O'Rourke & Macey, 2003; Ringquist, 2005).

EJ issues first gained widespread attention over 25 years ago with the publication of several studies highlighting the significantly higher than average concentrations of toxic waste facilities in minority and low-income communities (CRJ, 1987; GAO, 1983). Since this time grassroots EJ efforts, academic research studies, and policy activities have moved forward in parallel to evaluate and address differential exposure to environmental hazards and benefits. Collectively, these efforts led to the signing of Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" in 1994. After 1994 both research and grassroots action moved forward on a wide range of issues, but policy activities have remained centered on EO 12898.

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Almost 15 years have passed since the enactment of this order, but there has been little evaluation of the extent to which the mandates set forth have been implemented and enforced. The aim of this paper is to bridge this gap by focusing on two main research questions. First, is EJ acknowledged in federal agency assessment documents, and if so, to what extent? Second, is there sufficient information on populations and risks contained in these agency-level assessments to determine if proposed activities could create disproportionate impacts on minority and low-income communities?

To address these questions, we apply content analysis methods to two types of federal agency assessment documents—Regulatory Impact Analyses (RIAs) and Environmental Impact Statements (EISs). Using this methodology, we develop a novel approach to evaluating federal acknowledgement and enforcement of EJ issues at the program and project level and outline a framework for further policy evaluation. By analyzing both types of documents, we demonstrate that it is possible to systematically assess and compare agency EJ activities across both regulatory and project implementation scales. Such an assessment forms the basis for further evaluation of whether disproportionately affected minority and low-income communities are receiving attention, as mandated, at the national level.

In the next sections we provide a brief review of the research literature and policy context for our analysis (Section 2), outline the aims and scope of our approach (Section 3), describe our methodology and application (Section 4), detail our results (Section 5), and discuss some conclusions, policy implications, and areas for further research (Section 6).

## **2. Background**

Over the last three decades, the definition of EJ has widened to encompass both the processes of making equitable decisions and their desired outcomes. Most generally the term describes any disproportionate human health and environmental impacts facing minority and low-income populations and also efforts to avoid and address such impacts (EO 12898, 1994). This broad definition has been a major strength, where it has motivated diverse EJ grassroots action and academic studies, but also it has also been a weakness, particularly in large-scale policy design and program evaluation. The mandates set forth in EO 12898 are expansive, ranging from building community capacity, improving public awareness, and educating citizens about exposure to environmental hazards to expanding minority participation in environmental decisionmaking. Programs have been directed variously at addressing existing disparities and avoiding the creation of new inequalities. The far-reaching goals and aims of both EO 12898 and related agency EJ programs make the impacts of this mandate difficult to assess and evaluate.

These difficulties are evident in the wide variety of approaches agencies have taken to meeting federal EJ requirements. Because federal agencies ranging from the Environmental Protection Agency (EPA) to the Department of Energy (DOE) to the Department of Transportation (DOT) have focused on different aspects of the problem relevant to their responsibilities and needs, there has been little attention to systematically assessing and comparing agency EJ initiatives and their impacts. Doing so requires a comprehensive but flexible approach that builds on both EJ research and policy to date. The next subsections provide a brief overview of the research and policy foundations for our approach to federal-level EJ program evaluation.

## **2.1 EJ Literature**

Early EJ work brought together local movements against specific waste and industrial facilities; more broadly focused research analyses showed significant disparities in the location of these types of environmental hazards in primarily poor and minority communities. Seminal works on this topic include the U.S. Government Accountability Office (GAO) study of off-site hazardous waste landfills in EPA Region IV, which found that three of the four landfills in the region were in African-American communities although they constituted a minority of the region's total population (GAO, 1983); a 1987 Commission for Racial Justice report, which examined 415 operating commercial hazardous waste facilities and found such sites were more likely to be located in communities with significant minority populations (CRJ, 1987); and the book *Dumping in Dixie: Race, Class, and Environmental Quality* by Robert Bullard (1990).

Subsequent analyses applied increasingly sophisticated mapping and measurement tools to examine finer-grained changes in the timing and locations of environmental hazards and their correlation with various population exposure pathways (Bryant & Mohai, 1992; Lejano & Iseki, 2001; Mohai & Saha, 2006, 2007; Pastor, Sadd, & Morello-Frosch, 2004; Saha & Mohai, 2005; Stretesky & Hogan, 1998; Szasz & Meuser, 2000). Other studies extended EJ literature into new applications, focusing on topics including Superfund site prioritization (Anderton, Oakes, & Egan, 1997), environmental litigation and regulatory enforcement (Ringquist, 1998, 2001), and urban property valuation (Ihlanfeldt & Taylor, 2004).

More recently, meta-analyses illustrate the wide range of methods and results that have emerged over time. For example, Shapiro (2005) states, "The majority of early environmental justice studies indicate environmental inequities. The record is mixed, however, among the more methodologically sophisticated studies (Adeola 1994; Anderton et al. 1994; Cutter et al. 1996; GAO 1995; Glickman and Hersh 1995; Hamilton 1995a, 1995b; Jenkins et al. 2004; Lambert

and Boerner 1997; Mohai 1995; Morgan and Shadbegian 2003; Oakes et al. 1996; Yandle and Burton 1996)” (p. 374). In contrast, in their meta-analyses both Ringquist (2005) and Mohai and Saha (2006, 2007) find that the majority of EJ studies show a statistically significant relationship between race and many types of environmental hazards.

Despite advances in spatial analysis tools and technologies that allow evaluations of EJ issues at multiple scales, most studies to date have focused on documenting if, where, and under what conditions environmental injustices exist. In contrast, there is limited research applying EJ spatial analysis methods to evaluating proposed solutions, such as federal programs intended to address environmental injustice (Holifield, 2001). This trend in EJ research toward increasingly detailed analyses and evaluations of specific environmental hazards has resulted in a divide between EJ research and government EJ initiatives and programs, which remain extremely broad in scope and intent (Bowen, 2002; Foreman, 1998). As new environment and climate policies have become more prominent and EJ efforts to prevent new disparities have emerged as an important element of broader public acceptance, this divide has widened further.

## **2.2 Policy Context**

Although there is still disagreement in the academic literature about where, under what contexts, and to what extent minority and low-income communities are faced with significantly greater existing environmental burdens, the case for avoiding the creation of new disparities has strengthened over time. Acknowledgement of EJ issues is a fundamental prerequisite to effectively identifying and addressing such potential emerging distributional impacts. Evaluating if and to what extent EJ issues are acknowledged across federal agency documents requires a careful review of EJ-related mandates. Three particularly important laws and mandates are EO 12898 (also referred to here as the EJ EO), the National Environmental Policy Act (NEPA), and EO 12866 on cost-benefit analysis (also referred to here as the CBA EO).

The EJ EO established the first EJ-specific mandates at the federal level. Issued in 1994 by President Clinton, this order is intended to ensure that federal agencies account for any disproportionately high and adverse human health effects on low-income and minority populations that could result from their own actions, including policy setting, implementation, and all other related activities. The EJ EO builds on the more established requirements of NEPA. Enacted in 1970, NEPA was the first nationwide law to require federal agencies and private entities to consider the environmental impacts of all proposed projects and actions (NEPA, 1969).

Like NEPA, the CBA EO was signed into effect to systematically improve how federal regulations are designed and evaluated. This EO requires that all federal agencies document and weigh the costs, benefits, and risks of regulations before instituting them (EO 12866, 1993). NEPA and the CBA EO also mandate that federal agencies make their assessments available and transparent to stakeholders and the general public. In this section we review three main aspects of each of these key federal EJ policies: (1) what they require, (2) how they are implemented, and (3) how they are enforced.

Each of these policies mandates that federal agencies evaluate and make public the impacts of their actions and decisionmaking. Although each policy establishes its own criteria that federal agencies must consider, the requirements of the EJ EO overarch those of both NEPA and the CBA EO. In other words, NEPA and the CBA EO each call for specific documentation and the EJ EO further mandates that EJ concerns are included in those assessments. In most cases, the NEPA documentation process begins with an initial Environmental Assessment (EA) that can then lead to a Finding of No Significant Impact or a more detailed EIS.

An EIS is required of federal agencies when they propose any major project (such as an interstate highway or public waste facility) that will significantly affect humans and/or the natural environment (NEPA, 1969). An EIS is intended to detail the purpose of and need for the proposed project, describes the affected area, presents a range of alternatives to the project, analyzes the environmental impact of each alternative, and makes these findings available for public review before identifying a preferred option (NEPA, 1969). Because meeting these requirements can be highly complex, these and other federal mandates are often accompanied by guidance documents. A guidance document is an analytic tool that lays out the goals of a regulation, how this regulation intersects with an agency's operations, and proposes an agency-specific strategy to meet the regulation. To achieve compliance with the EJ EO, guidance documents were developed specifying that EISs should also include a review of any disproportionate environmental or health burdens on minority and low-income communities.

Similar to the EIS requirements established by NEPA, the CBA EO dictates that federal agencies issue a RIA every time they draft regulations that could affect the amount of money in circulation in the U.S. economy by at least \$100 million (EO 12866, 1993). Examples of such regulations vary from environmental control technology standards in the electricity sector and fuel economy standards in the transportation sector to more recent climate change-related proposals to limit greenhouse gas emissions across the entire economy. RIAs must document and make public the problem a regulation aims to solve, alternatives to the regulation, and their respective risks, costs, and benefits (EO 12866, 1993). Within its mandate, the CBA EO



explicitly mentions distributional impacts, while the EJ EO and related guidance documents specify that variations in the costs, benefits, and risks facing low-income and minority populations must also receive consideration. Taken together, these documents suggest that EJ issues should be addressed as an implicit component of RIAs; however, the requirements set forth are far less explicit than comparable guidance for EISs.

The implementation of NEPA and the CBA EO involves multistep processes. These processes include assessment of a project or regulation, consideration of alternatives to each, drafting of an EIS or RIA, distribution of drafts for public comment, and finally submission of a revised EIS or RIA to the appropriate government body for compliance review. The implementation of the mandates set forth by the EJ EO is again overarching. It entails giving particular attention to impacts borne by low-income and minority populations from projects and regulations governed by NEPA and the CBA EO. To facilitate this integration, the EJ EO is supported by two main oversight bodies, the Interagency Working Group (IWG) and the Council on Environmental Quality (CEQ), which have each issued guiding documents. The IWG was created under the EJ EO and is made up of representatives from 17 federal agencies. It was initially tasked with drafting definitions of terms in the EJ EO necessary for its implementation such as “disproportionately high,” “low income,” and “minority” (EPA, 1999). Following on these definitions, the CEQ was given the responsibility of drafting a guidance further elaborating on the EJ EO’s principles as they apply to all federal agencies. Beyond this, each agency is responsible for issuing other guidance it requires to meet the EJ EO’s objectives.

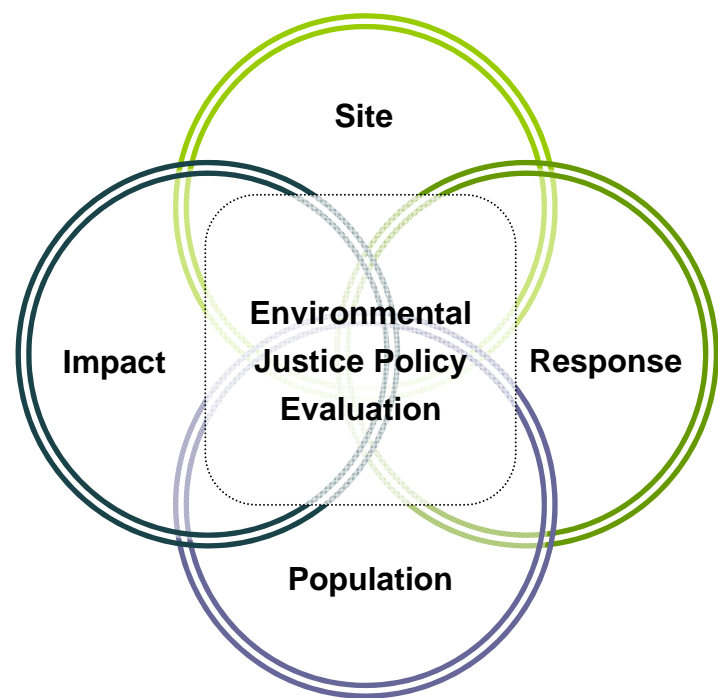
While the requirements of the EJ EO, NEPA, and the CBA EO overlap, the enforcement of each varies significantly. As a federal law, NEPA is enforced through judicial review, where noncompliance is addressed by the courts (Dogin, 1974). In contrast, EOs do not go through a congressional approval process. Instead they are signed by the President exclusively to direct the activities of the executive branch and its agencies. Thus, actions that violate the EJ EO and the CBA EO cannot be enforced judicially. The EOs leave both implementation and enforcement responsibility to federal agencies themselves (EO 12866, 1993; EO 12898, 1994). In the EJ EO, the CEQ was given explicit monitoring and enforcement responsibilities. The CEQ can gauge federal agency performance against the implementation objectives in relevant guiding documents. In this sense, the guiding documents serve a secondary function as enforcement tools. In addition to the IWG and the CEQ, the National Environmental Justice Advisory Council (NEJAC), EPA’s Office of Inspector General (OIG), and the GAO also have review authority.

NEJAC is a council made up of members that range from community activists to business and government representatives to promote dialogue on EJ across stakeholders (NEJAC, 2001).

The EPA OIG is an oversight body to the EPA, funded separately by Congress to objectively monitor EPA policymaking and action (Congress, 1978). The GAO is an executive office that monitors the practice and spending of all federal agencies (Congress, 1921). While none of these oversight bodies are explicitly mentioned in the EJ EO, evaluating compliance is within their scope. All three of these bodies have conducted evaluations and investigations of EJ EO implementation and the effectiveness of various agency efforts to date. Results of these reviews have been mixed, and we discuss the significance of these reviews alongside our conclusions and policy implications in Section 6.

A final broad element of enforcement is public comment and review. At both the RIA and EIS levels, draft and final documents are mandated to be publicly available in an effort to promote public input. The RIA public participation process is not as clearly defined as that of an EIS. For the latter, the NEPA process spells out that citizens are made aware of the scoping process that precedes the EA. The public can then review draft EISs and evaluate and make comments on federal agency proposals and alternatives. This process is intended to improve accountability and transparency; however, it does not necessarily provide grounds for judicial review. The extent to which such enforcement could occur is controversial (Foster, 2008; Johnson, 1997; Outka, 2006).

In short, the EJ policy landscape is multifaceted. There are various policy requirements, and those associated with the implementation of the EJ EO are intertwined with those of NEPA and the CBA EO. In the case of the EJ EO, implementation, compliance, and enforcement all depend heavily on the definitions and metrics set forth in guiding documents. Table 1 provides a snapshot of where these key EJ definitions appear in NEPA legislation, the CBA EO, and relevant EJ EO guiding documents. We group terms into several categories that capture the population, site, impact,



**Figure 1. Fundamental Elements of EJ Policy Evaluation**

and response variables central to both academic and policy EJ analysis (CEQ, 1997; Outka, 2006). The rows list policy and guiding documents for both RIAs and EISs and highlight where specific terms appear.

Policy or Guiding doc	EJ				Population							Site		Impact				Response						
	Environmental equity	Environmental injustice	Environmental justice	Environmental racism	Non Caucasian	Race	Minority	Non white	Low income	Poverty	Affected group	Affected community	Affected population	Affected site	Affected area	Human health effects/impacts	Adverse	Disproportionate	Environmental effects	Environmental impacts	Public comment	participation	Public participation	Mitigate*
EIS	NEPA (1969)																							
	CEQ (1997)		x				x		x							x	x	x	x				x	x
	EPA (1998)		x				x		x					x		x			x					
	EPA (1999)		x				x		x							x	x	x	x				x	x
	USDA (1997)		x				x		x							x			x					
	DOT (1997)		x				x		x							x	x	x	x					
RIA	CBA EO (1993)																							
	EPA (2000)						x		x							x	x	x	x					
	OMB (2003)																							

**Table 1. Summary of Categories of EJ Terms in EJ-Related Federal Laws, Executive Orders, and Guidance Documents Associated with RIAs and EISs (NEPA, 1969; CEQ 1997; EPA 1998; EPA 1999; USDA 1997; DOT 1997; EO 12866, 1993; EPA 2000; OMB 2003)**

The presence of these terms and definitions is the foundation of the EJ evaluation outlined here. As Figure 1 shows, identification of EJ issues requires basic consideration of four main building blocks: site, population, impact, and response. Without information on any single building block, EJ analyses are likely to be incomplete. Evaluating the extent to which EJ concerns are acknowledged across federal agencies and whether these agency assessments provide sufficient information to assess if EJ-targeted efforts are effective requires clear definitions of the search terms in each of the categories in both Table 1 and Figure 1. We outline the scope of our study and the criteria for selecting specific agencies, documents, and EJ search terms for analysis in detail in the next section.

### 3. Aims and Scope

Academic research on EJ issues has only recently begun to move toward policy analysis and evaluation (Konisky, 2007). The goals of this study are to contribute to this new area of EJ literature in two main areas. First, we aim to expand the focus of EJ analysis. Currently, most EJ studies are site-, impact-, or program-specific and fragmented across various applications, disciplines, and research methods. Focusing on federal-level policy analysis offers opportunities to extend EJ research into broader evaluation of increasingly expansive environmental programs and emerging regulations. Second, we aim to shift the focus of EJ research from finding evidence of existing disparities to evaluating programs intended to avoid and limit the creation of new environmental inequalities. From this perspective, EO 12898 is a cornerstone of federal EJ activities, and we look across a decade of federal EJ assessment under this mandate to determine if EJ issues are adequately articulated and addressed.

We focus our analysis at the national level, and this view allows us to examine two widely issued types of federal documents—RIAs and EISs. As discussed in the policy section, these documents are windows into federal agencies' efforts to consider how large-scale regulations, programs, and projects could impact low-income and minority communities. Moreover, these documents are the primary vehicles for public participation and input into federal decisionmaking, one of the major process goals of the EJ EO. At this interface between federal agencies and the public, it is critical to evaluate the extent to which EJ issues are acknowledged, addressed, and communicated more widely.

All this said, RIAs and EISs are by no means the only types of documents that could reflect federal EJ activities; however, they provide a robust point of departure for further analysis. EJ research and policy have evolved substantially since the signing of EO 12898 in 1994. Given these developments, we expect to see variations in where, when, and how often EJ terms appear in federal agency assessment documents. Our three main hypotheses are as follows:

1. *Variations across federal agencies:* Based on the differences among federal agencies, we expect that the types and frequencies of terms found in documents will vary by agency and that agencies with higher degrees of environmental responsibility will use more EJ terms than others. For example, we expect to find a higher occurrence of EJ terms in EPA documents than in those by DOE, and in those by DOE compared with DOT.
2. *Differences between large- and smaller-scale assessment documents:* We also hypothesize that the frequency of specific terms will be higher in EISs than in RIAs. Because EISs

typically focus on specific projects, we expect to see greater use of site and population terms. This focus could also increase the total EJ-related word count for EISs relative to RIAs.

3. *Changes in the frequency and usage of EJ terms over time:* Both the percentage of RIAs and EISs that use EJ terms as well as the frequency of their use increases over time. We expect that as agencies developed and gained access to the tools to implement the EJ EO after 1994, more attention would be paid to EJ terms in both RIAs and EISs.

To test these hypotheses we focus on three agencies, two types of assessment documents, and five categories of EJ terms. Our criteria for selecting specific agencies, documents, and terms to characterize and evaluate federal EJ activities are discussed individually in the subsections below.

### 3.1 Agencies

There are numerous federal agencies subject to the requirements established in EO 12898; however, there are also significant differences in the core missions of these agencies. As a result, agencies vary greatly in the magnitude of their environmental footprint and their environmental protection responsibilities. An agency’s environmental footprint describes the potential for its activities to directly alter or impact the natural environment. Environmental protection responsibility refers to an agency’s regulatory authority over activities with potentially significant impact on the natural environment (NEJAC, 2002). We categorize federal agencies subject to the EJ EO along these two dimensions in Table 2.

		Environmental Footprint			
		Large	Small		
Environmental Protection Responsibility	Low	None	DOL NIEHS ASTDR HUD HRSA	HHS OSTP OAPDP Commerce	OMB ODAPEP NEC CEA
	High	<b>DOT</b> <b>DOE</b> DOD USDA		DOI DOJ <b>EPA</b>	

**Table 2. Federal Agencies Grouped by Levels of Environmental Protection Responsibility and Size of Their Environmental Footprints. Adapted from NEJAC (2002), p. 37.**

Out of the set of federal agencies subject to the EJ EO, we select three for analysis here—DOE, DOT, and EPA—highlighted in bold in Table 2. DOE and DOT represent agencies with both large environmental footprints and high environmental protection responsibilities (NEJAC, 2002), while the EPA is the primary authority for environmental protection in the United States.

While all of the agencies listed in Table 2 play a role in ensuring EJ mandates are widely implemented and enforced, the three agencies selected here are arguably those that have the most direct impact on the locations of environmental hazards in combination with core missions directed at minimizing the environmental impacts of their own and others' activities. Collectively, these agencies have the largest potential to catalyze or prevent disproportionate impacts on low-income and minority populations. Other agencies play indirect enforcement roles, like the Department of Justice, or are largely outside traditional environmental review processes, like the Department of Defense. Therefore, the three agencies selected here are also chosen because they are those for which direct environmental assessment documents are most readily available and potentially most immediately relevant to public involvement in both the process and outcome aspects of federal EJ decisionmaking.

### **3.2 Documents**

As discussed in Section 2.2, there are a wide range of assessment documents associated with various EJ-related policies, laws, and mandates. EISs and RIAs are two widely used, longstanding federal agency documents that characterize the potential impacts of agency projects and federal regulations. Since the EJ EO mandates that EJ concerns be represented throughout the activities of federal agencies at both the project level and regulatory design level, EISs and RIAs are two principal vehicles for noting and addressing EJ issues, and they serve as the primary interface between federal agencies and the general public. For this study, we collected publicly available final RIA and EIS documents issued by DOE, DOT, and EPA for the period from 1995 to 2004, following the enactment of EJ EO in 1994 (see Appendices A and B).

Final EISs for DOE and DOT were obtained through the agencies' respective websites (DOE, 2007; DOT, 2007) and related online links and searches. For EPA, EISs were located through EPA's NEPA website and related general internet searches. A total of 5 EPA, 13 DOT, and 25 DOE EISs were compiled for this analysis. In a similar search process, we collected RIAs for all three federal agencies through the American Enterprise Institute–Brookings Institution Joint Center's RIA online database (AEI/Brookings, 2007). RIAs prepared by EPA were also found through the National Center for Environmental Economics Regulatory Economic Analyses Inventory online database (NCEE, 2007). Only one final RIA per regulation with a title containing either the words "regulatory" or "economic" along with "analysis" or "assessment" was included in our analysis. In total, 94 EPA, 30 DOT, and 5 DOE RIAs were analyzed.

The sets of EISs and RIAs analyzed here represent a cross-section of the types of readily publicly available federal documents covered by the EJ EO for the time frame of this study. Each

set of documents is organized by the issuing agency, allowing us to analyze variations across agencies. We further categorized both types of documents into two time frames: 1995–1999 and 2000–2004. By splitting the documents into two equal periods, we were able to analyze how acknowledgement of EJ terms has changed over time. It is important to note that agency activities vary significantly across the time frame of this analysis. Therefore, it is unsurprising to see the small number of EISs issued by EPA or similarly the small number of RIAs issues by DOE. These variations across agency and over time simply highlight the need for a flexible framework to evaluate EJ implementation at multiple scales of analysis.

### **3.3 Terms**

The final dimension of our analysis centers on EJ-related terms. As Figure 1 shows, there are four main components of EJ processes and outcomes: site, population, impact, and response. Each of these categories can be described by multiple terms. For the purposes of this analysis we select common terms from the EJ literature associated with each of these four categories along with general EJ terms used in research and practice over the past decades. Since environmental disparities first became a topic of activism, research, and policy, EJ issues have been variously referred to by terms including environmental justice, environmental injustice, environmental equity, and environmental racism. Similarly, populations of concern, those potentially disproportionately affected by federal projects or regulations, are typically characterized and referred to by using particular terms, including minority and low income, or more generic terms, such as race. Our selected search terms and categories are listed along the top of Table 1.

Should these terms show up in an EIS or RIA, we reason that EJ issues would at least receive cursory acknowledgement in the document. By categorizing a universe of EJ terms that taken together provide the fundamental vocabulary needed to address EJ issues, it is possible to evaluate the extent to which various assessments contain the basic building blocks required for EJ analysis. This categorization is conceptualized in Figure 1. The outside circles represent the fundamental elements of EJ issues. These are the physical site or location, the population or community, the impacts of the proposed project or regulation, and the response federal agencies would use to mitigate any anticipated disproportionate impacts. EJ analysis requires careful assessment at the intersection of all four of these building blocks. We argue that to adequately judge whether federal projects or policies could lead to disproportionate impacts on low-income and minority populations that a combination of these elements have to be included and discussed in EISs and RIAs.

#### 4. Methodology: Content Analysis

Given the scope of this study as outlined above, we use a content analysis approach to test our hypotheses on the use of EJ terms in federal assessments across agencies, by document type, and over time. A content analysis is a systematic classification of the direct and latent material in texts to determine their relative importance and meaning in context (Krippendorff, 2004). This method has been used widely in fields from linguistics, social psychology, and sociology and more recently in journalism and communication studies (Krippendorff, 2004). The aim of this method is to allow for quantitative analysis of qualitative information. Research questions answerable through content analysis are typically framed to evaluate if and to what extent particular terms occur in and across large collections of text. In the case of this study, our research questions and hypotheses outlined in Section 3 focus explicitly on if and to what extent EJ issues are acknowledged or noted in agency RIA and EIS documents over time.

Content analyses are typically conducted in three main stages: (1) identifying and categorizing terms for a text search, (2) testing and refining the selected search terms as needed, and (3) counting and evaluating the frequency and location of specific terms within texts (Mayring, 2008). Over time, variants of this method have evolved. The specific methodology employed here was developed in the 1980s and is termed “qualitative content analysis” (Mayring, 2008). It is important to note that as with any simplified form of analysis, there are strengths and weaknesses inherent in content analysis. Its greatest strengths are that it allows for summary and comparison of diverse texts and fragmented documents. The weakness of content analysis is that it is vulnerable to word selection bias. In other words, failure to properly choose a comprehensive set of words for which to search can lead to inaccurate characterizations of the content being evaluated. This is especially true for texts with novel terms or atypical usages.

For example, in our study we initially searched for the term “health effects” to identify potentially significant human health impacts of federal projects of regulations. However, an initial review of sample RIA and EIS documents returned sections of text describing the health of ecosystems instead of the health of individuals or communities. Based on this preliminary result, we refined our search to include the terms “human health effects” and “human health impacts.” Similarly, we use the abbreviated term “mitigat\*” to capture all longer forms of the word including mitigation, mitigate, and mitigated. Based on careful pretesting of terms, we narrowed our analysis to the set of terms listed along the top of Table 1 and discussed in Section 3.3 to search the sets of RIA and EIS documents described in Section 3.2. The results of our analysis are detailed below.



## 5. Results

Using content analysis on the 43 EISs and 129 RIAs described above, we test our three hypotheses by evaluating differences in the counts of EJ terms used across agencies, by document type, and over time. In this section we present basic summary statistics on (1) the percentage of all RIAs and EISs that use key EJ terms at least once and (2) the average number of times key EJ terms are mentioned in each document. The percentage-based results show the extent to which EJ issues are noted by different agencies in their RIAs and EISs over time. The average count of key terms per document highlights the level of attention paid to EJ building blocks across agencies, by document, and over time. In the graphs that follow, we summarize our results using the five categories of EJ terms listed in Table 1. These two sets of results are discussed in detail in the following subsections. Taken together they provide the basis for a third subsection on quantitative hypothesis testing within a larger EJ program evaluation framework.

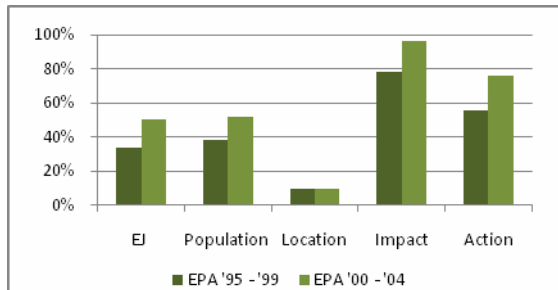
### 5.1 Acknowledgement of EJ Issues

Agency acknowledgement of EJ issues in assessment documents is highly uneven. Figures 2–4 and 5–7 illustrate these results for RIAs and EISs, respectively. Each graph shows the percentage of documents for each agency that mention key EJ terms in our five main categories of terms at least once in two five-year periods. For reference, the total numbers of analyzed RIA and EIS documents are shown below in Tables 3 and 4, respectively.

Figure 2 shows that across all EPA-issued RIAs there were EJ terms noted from every category, with impact terms mentioned across the greatest number of RIAs and the percentage of EPA RIAs mentioning all EJ terms increasing over time. DOT RIAs follow a similar pattern, as Figure 3 illustrates, with the exception of general EJ terms and location terms, which are not included in any DOT documents. Figure 4 reveals that DOE RIAs also omit general EJ and location terms; however, all of the documents analyzed include at least one term from the other categories of EJ terms in both time periods. It is important to note, however, that only five DOE RIAs were available for this analysis, and a larger sample could yield different results.

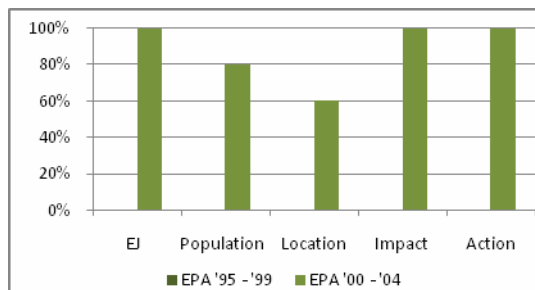
Examining the percentages of EIS documents that acknowledge EJ issues reveals greater differences among agencies and over time. Figure 5 shows that no EPA EISs were available for analysis between 1994 and 1999, but a high percentage of EPA EISs mention EJ terms across all categories from 2000 to 2004. In fact all of these documents use general EJ terms. Similarly, a high percentage of both DOT and DOE EISs use EJ terms representing all categories (Figures 6 and 7). However, usage of these terms over time is mixed. The percentage of all DOT EISs that mention EJ terms drops over time across all categories, while that of DOE EISs increases. Interestingly, impact terms are least prevalent in all DOE EISs and more recent DOT EISs.

**Percentage of Agency RIAs Using EJ Terms in 1995–1999 and 2000–2004**

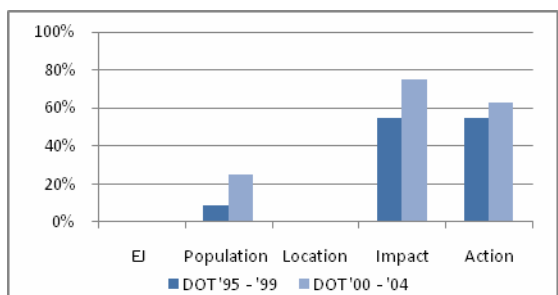


**Figure 2. Percentage of EPA RIAs with Specific EJ Terms**

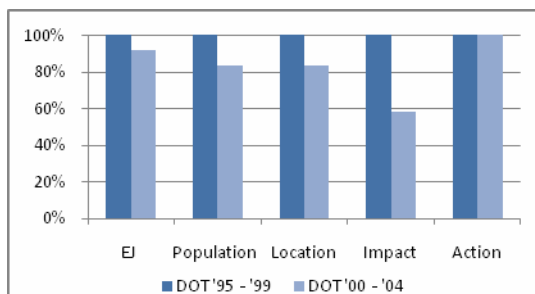
**Percentage of Agency EISs Using EJ Terms in 1995–1999 and 2000–2004**



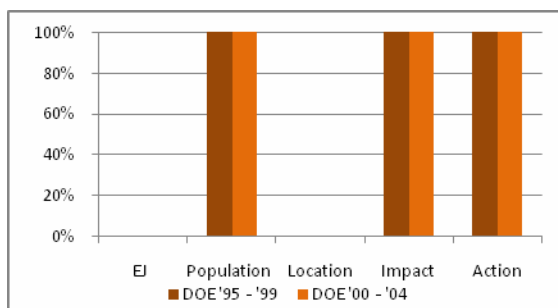
**Figure 5. Percentage of EPA EISs with Specific EJ Terms**



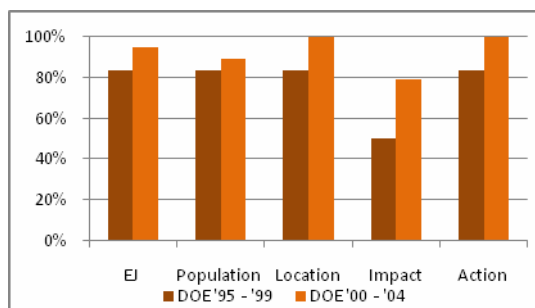
**Figure 3. Percentage of DOT RIAs with Specific EJ Terms**



**Figure 6. Percentage of DOT EISs with Specific EJ Terms**



**Figure 4. Percentage of DOE RIAs with Specific EJ Terms**



**Figure 7. Percentage of DOE EISs with Specific EJ Terms**

Number of Publicly Available RIAs Analyzed	
EPA '95 - '99	45
EPA '00 - '04	54
DOT '95 - '99	22
DOT '00 - '04	8
DOE '95 - '99	2
DOE '00 - '04	3

**Table 3. Total Number of RIA Documents Analyzed**

Number of Publicly Available EISs Analyzed	
EPA '95 - '99	0
EPA '00 - '04	5
DOT '95 - '99	1
DOT '00 - '04	12
DOE '95 - '99	6
DOE '00 - '04	19

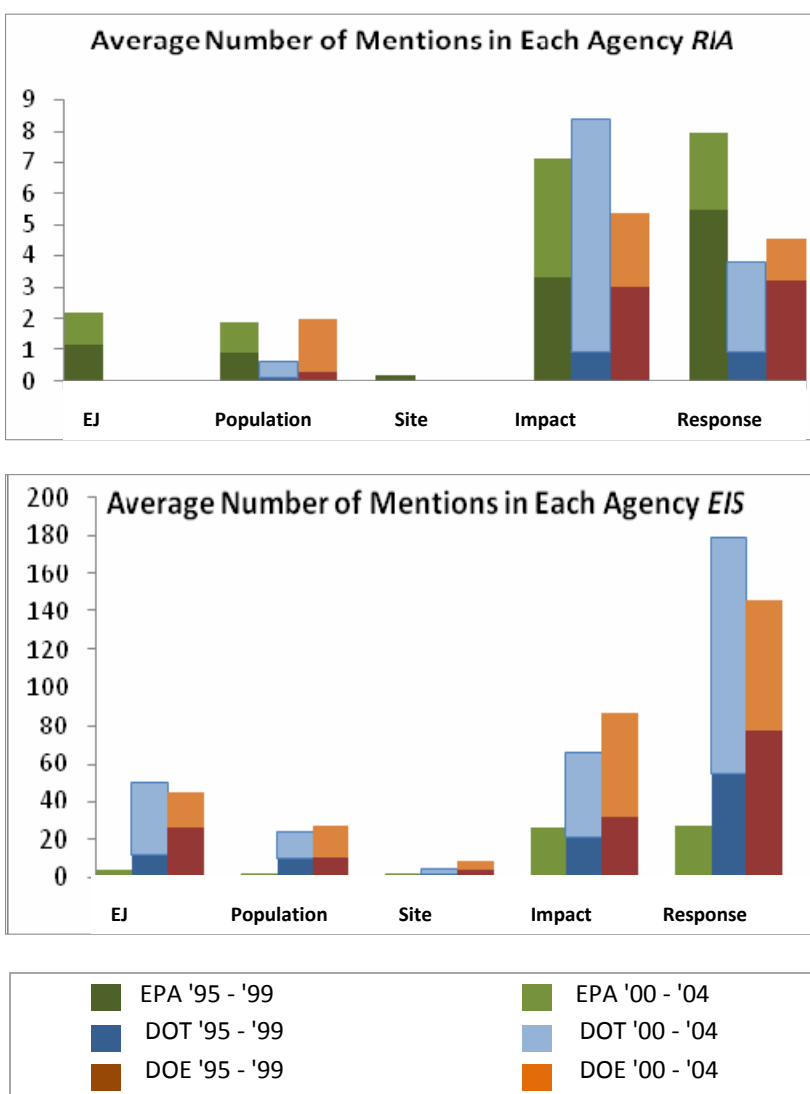
**Table 4. Total Number of EIS Documents Analyzed**

### 5.2 Attention to EJ Building Blocks

The summary statistics discussed above highlight the extent to which EJ issues are acknowledged across agencies, documents, and time; however, the presence of EJ terms alone does not mean that there is adequate information included for comprehensive EJ analysis. Evaluating whether there is sufficient information to determine if impacts on minority and low-income populations are disproportionate requires closer examination of where and how often specific EJ terms appear in agency assessments. As discussed in Section 3, EJ issues are comprised of four main building blocks—site, population, impact, and response—and effective analysis requires information on all four.

Figures 8 and 9 show the average number of key terms used in agency RIAs and EISs over time to highlight the level of attention to specific categories of EJ terms. In contrast to the figures above, these graphs display results for all three agencies side-by-side with two time periods stacked in each bar. The lower portion of the bar represents the first time period, and the upper represents the second.

Both figures highlight how the frequency of terms mentioned varies by agency and category of term over time. Unsurprisingly, EIS documents, which are significantly longer than RIAs, include far higher numbers of terms on average. Also there is an overarching pattern of greater use of impact- and response-related EJ terms



**Figure 8 (top) and Figure 9 (bottom). Average Number of EJ Terms in Agency RIAs and EISs in 1995–1999 and 2000–2004**

across all agencies and both documents types. In contrast, acknowledgement of potential population-level disparities appears limited in both RIAs and EISs given the significantly smaller number of references to general EJ, population, and site terms. This suggests that agencies remain focused generally on impacts and responses, but EJ issues, particularly population-level disparities in impacts, are given less attention within assessments. Encouragingly, although attention to EJ-, population-, and site-specific terms is overshadowed by the focus on impact and response terms, the use of population-specific terms in RIAs has increased over time in both DOT and DOE documents.

Overall, both Figures 8 and 9 reveal the gaps in EJ assessment across all three agencies, two types of documents, and five categories of EJ terms. These gaps suggest the need for improvements in how the fundamental building blocks of EJ issues are assessed and included in RIAs and EISs and how implementation efforts are eventually evaluated. The next subsection returns to the hypotheses outlined in Section 3 and highlights how the analytic approach and results presented here can be used as the basis for a broader EJ program evaluation framework.

### ***5.3 Key Dimensions of an EJ Program Evaluation Framework***

In outlining the aims and scope of this study, we articulated three hypotheses about how acknowledgement and attention to EJ issues could vary across agencies, by document type, and over time. These three dimensions of analysis are critical to any EJ program evaluation effort. The content analysis approach and application presented in this paper highlight many opportunities for further analysis of other agencies and/or institutions responsible for considering EJ issues at the federal, state, or local level; other types of assessment documents; and longer time scales. The results discussed above reveal that, while content analysis could serve as an important EJ program evaluation and enforcement tool, federal agency assessment of EJ issues has been very uneven to date. In summary, below is a brief discussion of the extent to which our analysis of RIAs and EISs allows us robustly test our three hypotheses.

*Variations across federal agencies:* Due to the limited numbers of readily publicly available RIAs and EISs for some agencies, it is difficult to test the extent to which federal agencies with higher degrees of environmental responsibility also have higher usage rates of key EJ terms. In support of this hypothesis, we find that EPA RIAs use both general EJ and location terms that are not used in any DOT or DOE RIAs. In addition the percentage of EPA RIAs that include all EJ terms is higher than DOT, but far less than DOE; all five DOE RIAs analyzed here include at least one population, impact, and response term. Results of the average number of

mentions per document are mixed across agencies, and we can neither support nor clearly reject our hypothesis based on these data.

*Differences between large- and smaller-scale assessment documents:* From our analysis we see that a greater percentage of all agency EISs mention EJ terms in all categories than RIAs. Likewise, the average number of mentions for EJ terms is far greater in EISs than RIAs. However, this could be a function of document length; where EISs documents can exceed 500 pages in length, RIAs are typically significantly shorter. Thus there is also insufficient data to support or reject this hypothesis.

*Changes in the usage and frequency of EJ terms over time:* In cases where agencies have issued large numbers of readily publicly available assessment documents, the percentage of both RIAs and EISs that mention EJ terms at least once increases over time. This increase in the frequency of EJ terms mentioned is seen in EPA and DOT RIAs and DOE EISs. In contrast, only DOT RIAs and EISs show a clear increase in the average number of mentions across all categories of EJ terms over time. Results are mixed across categories of terms in documents issued by the DOE and EPA.

## 6. Conclusions and Policy Discussion

Taken as a whole, this study provides both a methodological template for evaluation of federal-level EJ implementation and an example of how the approach can be applied to two longstanding types of federal assessments. Encouragingly, the results of this analysis reveal that most EIS documents include at least one mention of general EJ terms across all three agencies evaluated. Less encouragingly, there appear to be large gaps in the information required for effective analysis of potentially differential impacts on minority and low-income populations at the RIA level. This finding echoes the results of other studies that have criticized the efficacy of EISs and agency assessment documents more generally (see Gregory, Keeney, & von Winterfeldt, 1992). Broadly, the focus of federal assessments has remained centered on impact and response terms across agencies and over time. In contrast, terms necessary to evaluate potential disparities are used far less often, with location terms appearing least often, general EJ terms second least, and population terms used with mixed frequency.

We also see that the inclusion of terms at least once in a high percentage of documents does not necessarily correlate with a high frequency of their use within each document. For example, although EPA uses key EJ terms in all second-period EISs, each document does so only sparingly. The same is largely true of RIAs issued by DOE. It is possible that a cursory

mention of some EJ terms could indicate that no significant disproportionate impacts are anticipated as a result of the proposed project or regulation or that EJ issues have been dismissed for other reasons. Evaluating such subtleties requires a larger sample of documents and further research on where and in what contexts specific terms appear within documents. For example, we recognize that a cursory mention of EJ terms in a document draft is much different than if these terms populate the final Record of Decision.

There is no right answer to how many mentions of EJ issues and components are sufficient for effective EJ implementation and assessment. This analysis is not intended to suggest that such a metric of adequacy is useful or necessary. Instead our approach highlights how the use of content analysis as a simple program evaluation tool can highlight significant gaps in EJ implementation and enforcement and identify priority areas for additional attention. In this vein, areas for further research could include comparisons of various program or project alternatives presented in existing RIA and EIS documents; analysis of additional types of documents, such as EA documents or Findings of No Significant Impact; or extension of this method to other scales, such as state-level EJ assessment documents. Overall, the approach outlined here lays the groundwork for further analysis of various assessments in areas where EJ issues or alternatives are expected to be considered.

Substantively, our results and conclusions echo the findings of NEJAC in their 2002 review of federal EJ activities. Based on the testimony of several federal agencies, this report concluded that progress in implementing the EJ EO varied greatly across agencies, and there was no consistent framework in place for comparing results across agencies (NEJAC, 2002). Others have found also that cross-agency comparisons have been limited by a lack of procedural clarity on how EJ analyses, implementation, and reviews should be defined and conducted (Ansah et al., 2006; Stephenson, 2007).

By focusing on a small set of fundamental EJ building blocks, as shown in Figure 1, this paper attempts to bridge this gap and makes a first step toward establishing a framework for broader EJ policy evaluation. In order to effectively acknowledge and address EJ issues at any level, there must be some mention of the populations, locations, impacts, and responses involved. This simple categorization of EJ terms offers a lens through which to view agency EJ actions across various types of institutions, scales, and time frames. As Ringquist (2005) notes in his EJ meta-analysis, environmental policy has many goals, of which environmental equity is one, and effectively addressing real and perceived environmental injustices is an element of improving the “efficiency, effectiveness, innovativeness, and responsiveness of environmental regulation” more generally. (p. 241).

The need for this type of flexible yet comprehensive assessment is now critical. Despite the lack of evidence on the impacts or effectiveness of federal agency EJ activities, there is a renewed public and political interest in EJ programs, particularly as they relate to emerging climate policy and climate justice evaluations (Little 2007; Vandenberg & Ackerly, 2007; Kaswan 2008). The push for new energy and climate change legislation has raised concerns about disproportionate distribution of the costs and/or benefits of various policies. These efforts could have serious implications for EJ assessment and enforcement. As a result, it is critical to develop a clear system for defining and measuring the effectiveness of federal agency EJ activities to date, before these assessment tools are called upon to weigh impacts of broader environmental policies. This paper lays the groundwork for such an evaluation.

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## 8. Appendix A: RIAs Analyzed

Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
EPA	Federal Standards for Marine Vessel Loading and Unloading Operations and NESHAP for Marine Tank Vessel Loading and Unloading Operations, 2060-AD02	1995	51	0	1	24	0	5
EPA	Petroleum Refinery NESHAP, 2060-AD94	1995	211	0	2	38	0	1
EPA	Water Quality Guidance for the Great Lakes System, 2040-AC08	1995	62	1	9	93	1	27
EPA	Accidental Release Prevention Requirements: Risk Management Programs under Clean Air Act Section 112(r)(7), 2050-AD26, 61 FR 31668	1996	65	0	2	29	0	131
EPA	Acid Rain Program; Nitrogen Oxides Emission Reduction Program, 2060-AF48, 61 FR 67112	1996	55	0	5	42	0	22
EPA	Activities in Target Housing and Child-Occupied Facilities, 2070-AC64, 61 FR 45778	1996	269	12	55	25	0	15
EPA	Federal Operating Permits Program, 2060-AD68, 61 FR 34202	1996	50	0	0	10	1	56
EPA	Final Regulations for Revisions to the Federal Test Procedure for Emissions from Motor Vehicles, 2060-AE27, 61 FR 54853	1996	57	0	0	4	0	9
EPA	Financial Assurance Mechanisms for Local Government Owners and Operators of Municipal Solid Waste Landfill Facilities, 2050-AD04, 61 FR 60328	1996	14	0	0	7	0	3
EPA	Land Disposal Restrictions Phase III, Decharacterized Wastewaters, Carbamate Wastes, and Spent Potliners, 2050-AD38, 61 FR 15566	1996	97	0	0	4	0	3
EPA	Regulation of Fuels and Fuel Additives: Certification Standards for Deposit Control Gasoline Additives; Final Rule. 2060-AG06, 61 FR 35310	1996	-	0	1	8	0	9
EPA	Economic Analysis Of Air Pollution Regulations: Off-Site Waste And Recovery Operations, Final Report	1996	312	0	0	2	0	7
EPA	Regulatory Impact Analysis Control Of Air Pollution Emission Standards For New Nonroad Spark-Ignition Marine Engines	1996	130	0	1	9	0	2
EPA	Regulatory Impact Analysis Of The Proposed Intervention Level Program For Sulfur Dioxide, Final Report	1996	200	9	69	22	0	4
EPA	Addition of Facilities in Certain Industry Sectors; Revised Interpretation of Otherwise Use; Toxic Release Inventory Reporting; Community Right-to-Know, 2070-AC71, 62 FR 23834	1997	61	5	3	10	0	17
EPA	Control of Emissions of Air Pollution from Highway Heavy-Duty Engines, 2060-AF76, 62 FR 54694	1997	144	0	1	15	0	0
EPA	National Ambient Air Quality Standards for Ozone, 2060-AE57, 62 FR 38856	1997	43	4	2	55	0	38
EPA	National Ambient Air Quality Standards for Particulate Matter, 2060-AE66, 62 FR 38652	1997	52	1	2	34	0	50
EPA	New Motor Vehicles and New Motor Vehicle Engines Air Pollution Control: Voluntary Standards for Light-Duty Vehicles, 2060-AF75, 62 FR 31192	1997	81	0	0	9	0	14

## Resources for the Future

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Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
EPA	Transportation Conformity Rule Amendments: Flexibility and Streamlining, 2060-AG16, 62 FR 43780	1997	41	0	0	12	4	38
EPA	Hospital/Medical/Infectious Waste Incinerators: Background Information For Promulgated Standards And Guidelines: Regulatory Impact Analysis For New And Existing Facilities	1997	74	0	0	17	0	1
EPA	Hospital/Medical/Infectious Waste Incinerators: Background Information For Promulgated Standards And Guidelines-- Analysis Of Economic Impacts For Existing Sources	1997	45	0	0	0	0	0
EPA	Hospital/Medical/Infectious Waste Incinerators: Background Information For Promulgated Standards And Guidelines-- Analysis Of Economic Impacts For New Sources	1997	44	0	0	17	0	1
EPA	Regulatory Impact Analysis: National Low-Emission Vehicle Program, Final	1997	36	0	0	2	0	1
EPA	Disposal of Polychlorinated Biphenyls, 2070-AC01, 63 FR 35384	1998	291	4	4	7	0	0
EPA	Emission Standards for Locomotives and Locomotive Engines, 2060-AD33, 63 FR 18978	1998	51	0	1	4	0	9
EPA	Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region, 2060-AH10, 63 FR 57356	1998	185	4	5	17	0	59
EPA	Hazardous Waste Management System Identification and Listing of Hazardous Waste, 2050-AD88, 63 FR 42110	1998	82	0	0	9	0	15
EPA	National Emissions Standards for Hazardous Air Pollutants for Source Category: Pulp and Paper Production, 2040-AB53, 63 FR 18503	1998	51	0	0	23	0	17
EPA	National Primary Drinking Water Regulations: Disinfectants and Disinfection Byproducts, 2040-AB82, 63 FR 69390	1998	350	3	0	10	0	6
EPA	National Primary Drinking Water Regulations: Interim Enhanced Surface Water Treatment, 2040-AC91, 63 FR 69478	1998	46	8	9	15	0	13
EPA	Revision of Standards of Performance for Nitrogen Oxide Emissions From New Fossil-Fuel Fired Steam Generating Units, 2060-AE56, 63 FR 49442	1998	15	0	0	4	0	18
EPA	Economic Analysis For Final Effluent Guidelines And Standards For The Pharmaceutical Industry. (1998)	1998	250	10	5	45	0	7
EPA	Economic Impact And Regulatory Flexibility Analyses Of The Final Architectural Coatings VOC Rule	1998	300	0	0	9	0	54
EPA	Non-Electricity Generating Unit Economic Impact Analysis For The NOx SIP Call	1998	44	0	0	0	0	0
EPA	National Primary Drinking Water Regulations for Synthetic Organic Chemicals, 2040-AA55	1999	115	0	0	12	0	3
EPA	Persistent Bio-accumulative Toxic Chemicals, 2070-AD09, 64 FR 58666	1999	90	2	8	74	0	8
EPA	Radon in Drinking Water Health Risk Reduction and Cost Analysis, 64 FR 9560	1999	210	7	18	6	0	281
EPA	Regional Haze Rule, 2060-AF32	1999	270	2	7	26	0	16
EPA	Economic Analysis Of Air Pollution Regulations: Portland Cement, Final Report	1999	300	0	8	1	0	0

## Resources for the Future

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Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
EPA	Economic Analysis Of Final Effluent Limitations Guidelines And Standards For The Landfills Point Source Category, Final	1999	75	0	3	21	0	1
EPA	Economic Analysis Of The Final Phase II Storm Water Rule, Final Report	1999	351	8	9	40	1	27
EPA	Final Regulatory Impact Analysis Phase 2: Emission Standards For New Nonroad Nonhandheld Spark-Ignition Engines At Or Below 19 Kilowatts	1999	250	0	0	10	0	4
EPA	Final Regulatory Impact Analysis: Control Of Emissions From Marine Diesel Engines	1999	132	0	0	23	0	0
EPA	Modification Of The Hazardous Waste Program: Hazardous Waste Lamps--Final Economic Assessment, Final Document	1999	200	21	118	29	0	8
EPA	Control of Air Pollution From New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, 2060-AI23, 65 FR 6698	2000	523	0	14	37	0	10
EPA	Control of Emissions of Air Pollution from 2004 and Later Model Year Heavy- Duty Highway Engines and Vehicles, 2060-AI12, 65 FR 59896	2000	85	0	0	15	0	13
EPA	Findings of Significant Contribution and Rulemaking on Section 126 Petitions for Purposes of Reducing Interstate Ozone Transport, 2060-AH88, 65 FR 2674	2000	96	3	9	12	0	17
EPA	Revisions to the Water Quality Planning and Management Regulation, 65 FR 43586	2000	87	0	3	15	0	98
EPA	Economic Analysis For Listing Of Inorganic Chemicals, Notice Of Proposed Rulemaking Final Report	2000	58	0	0	4	0	1
EPA	Economic Analysis For Regulatory Modifications To The Definition Of Solid Waste For Zinc-Containing Hazardous Waste-Derived Fertilizers, Notice Of Proposed Rulemaking, Draft Report	2000	50	6	6	8	0	0
EPA	Economic Analysis Of Final Effluent Limitations Guidelines And Standards For Synthetic-Based Drilling Fluids And Other Non-Aqueous Drilling Fluids In The Oil And Gas Extraction Point Source Category	2000	200	76	97	20	0	5
EPA	Economic Analysis Of Final Effluent Limitations Guidelines And Standards For The Centralized Waste Treatment Industry	2000	250	18	71	36	0	13
EPA	Economic Analysis Of Final Effluent Limitations Guidelines And Standards For The Transportation Equipment Cleaning Category, Final Report	2000	244	0	2	26	0	5
EPA	Economic Analysis Of The Internal Combustion Engines MACT Standard, Final Report	2000	116	0	0	2	0	0
EPA	Economic Assessment For The Final Action Regarding Pretreatment Standards For The Industrial Laundries Point Source Category (Revised March 2000), Final Report	2000	200	6	6	5	0	18
EPA	Economic Impact Analysis For The Proposed Municipal Solid Waste Landfills, Proposed Regulation	2000	17	0	0	4	0	0
EPA	Proposed Arsenic In Drinking Water Rule	2000	245	8	13	41	0	4
EPA	Regulatory Impact Analysis Of The Final Rule For A 180-Day Accumulation Time For F006 Wastewater Treatment Sludges	2000	50	7	13	12	0	0
EPA	Technical And Economic Assessment: Mitigation Of Methane Emissions From Coal Mine Ventilation Air	2000	83	0	0	2	0	14

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Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
EPA	Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, 2060-AI69, 66 FR 5002	2001	194	11	8	56	0	38
EPA	Effluent Limitation Guidelines For Offshore Oil and Gas Facilities, 2040-AA12	2001	95	0	0	13	0	0
EPA	Identification of Dangerous Levels of Lead, 2070-AC63, 66 FR 1206	2001	37	9	11	40	0	23
EPA	National Emission Standards for Hazardous Air Pollutants for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills, 2060-AI34, 66 FR 3180	2001	26	0	0	17	0	13
EPA	National Primary Drinking Water Regulations; Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring, 2040-AB75, 66 FR 6976	2001	117	7	23	22	0	32
EPA	Reporting Thresholds: Community Right-to-Know Toxic Chemical Release Reporting 2070-AD38 66FR4500 66FR4500	2001	50	2	8	18	0	14
EPA	Economic Analysis For The Filter Backwash Recycling Rule	2001	162	6	17	18	0	6
EPA	Economic Analysis Of EPA's Direct Final Rule Amending 40 CFR Part 157 And 158 -- Criteria For Classification Of Solid Waste Disposal Facilities And Practices And Criteria For Municipal Solid Waste Landfills: Disposal Of Residential Lead-Based Paint Waste, Final	2001	56	6	10	13	0	2
EPA	Economic Analysis Of The Amendments To The Corrective Action Management Unit Rule (Background Document), Final	2001	136	5	12	9	1	4
EPA	Economic Analysis Of The Proposed Revisions To The National Pollutant Discharge Elimination System Regulation And The Effluent Guidelines For Concentrated Animal Feeding Operations	2001	418	0	0	16	0	9
EPA	Economic Assessment For The Proposed Concentration-Based Listing Of Wastewaters And Non-Wastewaters From The Production Of Paints And Coatings, Final Report	2001	234	7	10	11	0	2
EPA	Economic Impact Analysis For The Final Vegetable Oil Processing NESHAP, Final Report	2001	150	0	0	2	0	0
EPA	Economic Impact Analysis Of The Boat Manufacturing NESHAP, Final Report	2001	79	1	2	3	0	0
EPA	Economic Impact Analysis Of The Proposed Asphalt Roofing And Processing NESHAP, Final Report	2001	83	0	0	5	0	1
EPA	Economic Impact Analysis Of The Refractory Product Manufacturing NESHAP, Final Report	2001	91	0	0	3	0	0
EPA	Control of Emissions From Nonroad Large Spark-Ignition Engines, and Recreational Engines, 2060-AI11, 67 FR 68242	2002	208	0	1	23	0	20
EPA	Economic Analysis Of Air Pollution Regulations: Miscellaneous Organic Chemicals (MON), Final Report	2002	156	0	0	3	0	1
EPA	Economic Analysis Of Proposed Effluent Limitations Guidelines And Standards For The Meat And Poultry Products Industry	2002	699	1	0	8	0	1
EPA	Economic Analysis Of The Final Effluent Limitations Guidelines And Standards For The Iron And Steel Manufacturing Point Source Category	2002	230	2	5	15	0	1

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Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
EPA	Economic Impact Analysis For The Supplemental Proposal To The Municipal Solid Waste (MSW) NESHAP, Final Report	2002	19	0	0	7	0	5
EPA	Economic Impact Analysis Of Final Coke Ovens NESHAP, Final Report	2002	139	0	0	0	0	4
EPA	Economic Impact Analysis Of Final Integrated Iron And Steel NESHAP, Final Report	2002	128	0	0	0	0	3
EPA	Economic Impact Analysis Of Metal Can MACT Standards, Proposed	2002	84	0	0	4	0	0
EPA	Economic Impact Analysis Of Proposed Iron And Steel Foundries NESHAP, Final Report	2002	140	0	0	0	0	2
EPA	Economic Impact Analysis Of The Final Reinforced Plastics NESHAP, Final Report	2002	19	0	1	3	0	3
EPA	Regulatory Impact Analysis Of The Proposed Industrial Boilers And Process Heaters NESHAP, Final Report	2002	320	5	13	55	0	5
EPA	Regulatory Impact Analysis Of The Proposed Plywood And Composite Wood Products NESHAP, Final Report	2002	168	5	7	58	0	1
EPA	Regulatory Impact Analysis Of The Proposed Reciprocating Internal Combustion Engines NESHAP, Final Report	2002	259	0	7	59	0	2
EPA	Prevention of Significant Deterioration (PSD) and Non-Attainment New Source Review (NSR), 2060-AK28, 68 FR 61248	2003	35	0	0	7	0	5
EPA	Economic Impact Analysis Of The Final Stationary Combustion Turbines NESHAP, Final Report	2003	155	0	0	5	0	8
EPA	Economic Impact Analysis Of The Refractory Product Manufacturing NESHAP, Final Rule, Final Report	2003	90	0	0	3	0	1
EPA	Economic, Environmental, And Benefits Analysis Of The Final Metal Products And Machinery Rule	2003	680	16	26	183	3	69
EPA	Revised Economic Assessment of the Association of Battery Recyclers, Proposed Rule, Final Rule	2003	262	0	0	3	0	0
EPA	Interstate Ozone Transport: Response to Court Decisions on the NOX SIP Call, NOX SIP Call Technical Amendments, and Section 126 Rules; Final Rule, 2060-AJ16, 69 FR 21604	2004	47	3	5	5	0	5
EPA	Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule, Final Rule	2004	180	5	29	29	0	8
EPA	Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines	2004	1581	0	28	88	1	50
EPA	Regulatory Impact Analysis for the Final Automobile and Light-Duty Truck Surface Coating NESHAP, Final Report	2004	131	0	0	25	0	3
EPA	Regulatory Impact Analysis for the Industrial Boiler and Process Heaters NESHAP, Final Report	2004	282	5	16	49	0	4
EPA	Regulatory Impact Analysis for the Stationary Internal Combustion Engine (RICE) NESHAP, Final Report	2004	247	0	9	46	0	1
DOT	Operation; Lighting Devices, Reflectors, and Electrical Equipment, 2125-AD27, 61 FR 15588	1999	21	0	0	3	0	3
DOT	Restraint Anchorage Systems, Child Restraint Systems, 2127-AG50, 64 FR 10786	1999	68	0	0	3	0	1



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Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
DOT	Operation of Motor Vehicles by Intoxicated Persons, 2127-AH39, 64 FR 35568	1999	7	0	0	1	0	1
DOT	Light Truck Average Fuel Economy Standard, Model Year 2001, 2127-AH52, 64 FR 16860	1999	4	0	0	1	0	0
DOT	Improved Standards for Determining Rejected Takeoff and Landing Performance, 2120-AB17, 63 FR 8298	1998	26	0	0	13	0	1
DOT	Light Truck Average Fuel Economy Standard, 2127-AG72, 63 FR 16699	1998	3	0	0	1	0	2
DOT	Incentive Grants for Use of Seat Belts, Allocation Based on State Seat Belt Use Rates, 2127-AH38, 63 FR 57904	1998	9	0	0	0	0	0
DOT	Uniform Criteria for State Observational Surveys of Belt Use, 2127-AH46	1998	7	0	0	0	0	0
DOT	HUBZone Empowerment Contracting Program, 3245-AE02, 63 FR 31896	1998	22	0	5	8	0	5
DOT	Interim Rules for Group Health Plans and Health Insurance Issuers Under NMHPA, 1545-AV52, 1210-AA63, 0938-AI17, 63 FR 57546	1998	21	0	0	1	0	2
DOT	Interim Rules for Group Health Plans and Health Insurance Issuers Under the Newborns and Mothers Health Protection Act, 1545-AV52, 63 FR 57546	1998	21	0	0	1	0	2
DOT	Federal Motor Vehicle Safety Standards; Occupant Crash Protection (Airbag Depowering), 2127-AG59, 62 FR 12960	1997	17	0	0	20	0	4
DOT	Light Truck Average Fuel Economy Standard, Model Year 1999, 2127-AG64, 62 FR 15859	1997	3	0	0	1	0	0
DOT	Interim Rules for Mental Health Parity, 1545-AV52, 1210-AA62, 0938-AE99, 62 FR 66932	1997	37	0	0	2	0	10
DOT	Interim Rules for Mental Parity, 1545-AV53, 62 FR 66932	1997	37	0	0	2	0	10
DOT	Financial Responsibility for Water Pollution (Vessels), 2115-AD76, 61 FR 9264	1996	46	0	0	0	0	2
DOT	Vessel Response Plans, 2115-AD81, 61 FR 1051	1996	192	0	0	14	0	6
DOT	Light Truck Average Fuel Economy Standard, Model Year 1998, 2127-AF16, 61 FR 14680	1996	4	0	0	1	0	0
DOT	Roadway Worker Protection, 2130-AA86, 61 FR 65959	1996	26	0	0	1	0	1
DOT	Gas Pipeline Safety Standards, 2137-AC25, 61 FR 28770	1996	18	0	4	3	0	5
DOT	Double Hull Standards for Vessels Carrying Oil in Bulk, 2115-AD61, 60 FR 13318	1995	10	0	0	1	0	4
DOT	Commuter Operations and General Certification and Operations Requirements, 2120-AF62, 60 FR 65831	1995	37	0	0	3	0	1
DOT	Federal Motor Vehicle Safety Standards; Tire Pressure Monitoring Systems; Controls and Displays, 2127-AJ2367, 67 FR 38704	2005	223	0	0	17	0	39
DOT	Tire Pressure Monitoring Systems, 2127-AI33, 67 Fr 38704	2002	-	0	0	0	0	0
DOT	Light Truck Average Fuel Economy Standard, Model Year 2004, 2127-AI68, 67 FR 16052	2002	10	0	0	8	0	1
DOT	Light Truck Average Fuel Economy Standard, Model Year 2003, 2127-AI35, 66 FR 17513	2001	5	0	0	3	0	0

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Regulatory Impact Analyses (RIAs)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
DOT	Interim Final Rules for Nondiscrimination in Health Coverage in the Group Market, 1545-AW02, 1210-AA77, 0938-AI08, 66 FR 1378	2001	45	0	2	70	0	12
DOT	Interim Final Rules for Nondiscrimination in Health Coverage in the Group Market, 1545-AW02, 66 FR 1378	2001	45	0	2	70	0	12
DOT	Advanced Airbags, 2127-AG70, 65 FR 30680	2000	412	0	0	8	0	5
DOT	Light Truck Average Fuel Economy Standard, Model Year 2002, 2127-AH95, 65 FR 17776	2000	4	0	0	3	0	0
DOE	Energy Conservation Program for Consumer Products; Conservation Standards for Room Air Conditioners, 1904-AA38, 62 FR 50122	1997	31	0	1	15	0	11
DOE	Energy Conservation Standards for Refrigerators, Refrigerator-Freezers and Freezers, 1904-AA47, 62 FR 23102	1997	17	0	0	9	0	8
DOE	Energy Conservation Standards for Clothes Washers, 1904-AA67, 66 FR 3314	2001	22	0	0	7	0	5
DOE	Energy Conservation Standards for Fluorescent Lamp Ballasts, 1904-AA75, 65 FR 56741	2000	12	0	0	8	0	5
DOE	Energy Conservation Standards for Central Air Conditioners and Heat Pumps, 1904-AA77	2001	33	0	15	14	0	7

## 9. Appendix B: EISs Analyzed

Environmental Impact Statements (EIS)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
EPA	Final Environmental Impact Statement (EIS): Proposed Rule on Environmental Impact Assessment of Nongovernmental Activities in Antarctica	2001	298	1	2	140	0	117
EPA	Pogo Gold Mine Project Final Environmental Impact Statement	2003	461	12	37	93	5	283
EPA	Final Environmental Impact Statement (FEIS) for Designation of the Palm Beach Harbor Ocean Dredged Material Disposal Site and the Port Everglades Harbor Ocean Dredged Material Disposal Site	2004	1101	2	1	145	2	33
EPA	Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York	2004	-	2	15	244	1	96
EPA	Final Environmental Impact Statement for the Port Royal Ocean Dredged Material Disposal Site Designation	2004	104	3	4	21	0	2
DOT	Buffalo Inner Harbor Development Project	1999	472	12	51	86	2	217
DOT	Dakota, Minnesota & Eastern Railroad Corporation (DM&E)	2001	2153	9	54	384	0	1343
DOT	Final Programmatic Environmental Impact Statement (PEIS) for the Magnetic Levitation Transportation Technology Deployment Program	2001	482	41	100	352	2	275
DOT	East Side Access MTA Long Island Rail Road Grand Central Connection	2001	1971	1	0	0	0	5
DOT	West Corridor Light Rail Project (Denver)	2003	606	54	100	158	4	682
DOT	Bayport Loop Buildout	2003		88	139	123	6	306
DOT	Interim Final Rule for Use of Locomotive Horns at Highway Rail Grade Crossings	2003	192	35	77	75	2	59
DOT	Going-to-the-Sun Road Rehabilitation	2003	354	0	0	0	0	5
DOT	Transbay Terminal/ Caltrain Downtown Extension/ Redevelopment Project	2004	1296	3	27	270	0	1189
DOT	Second Avenue Subway	2004	1935	115	423	771	36	957
DOT	Fulton Street Transit Center	2004	2094	68	178	822	7	562
DOT	South Corridor I-205/Portland Mall Light Rail Project Final Environmental Impact Statement (FEIS)	2004		31	197	166	8	442
DOT	Fernan Lake Road Improvement Project Final Environmental Impact Statement	2004	728	5	36	89	0	147
DOE	Sierra Pacific Power Company Alturas Transmission Line Project (November 1995)	1995	1091	1	0	0	0	0
DOE	Final Environmental Impact Statement On the Disposal of Decommissioned, Defueled Cruiser, Ohio Class, and Los Angeles Class Naval Reactor Plants (April 1996)	1996	341	46	41	41	41	41

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Environmental Impact Statements (EIS)				Total Count of Terms				
Agency	Title	Year	No. of pages	EJ	Population	Site	Impact	Response
DOE	Waste Isolation Pilot Plant Disposal Phase Supplemental Environmental Impact Statement (September 1997)	1997	1799	37	57	60	62	62
DOE	Final Environmental Impact Statement Nez Perce Tribal Hatchery Program (July 1997)	1997	503	0	1	6	6	6
DOE	BPA/Lower Valley Transmission Report Final Environmental Impact Statement (June 1998)	1998	444	4	2	2	2	2
DOE	Final Environmental Impact Statement - Construction & Operation of the Spallation Neutron Source (April 1999)	1999	1502	65	82	109	109	109
DOE	Bonneville Power Administration Transmission System Vegetation Management Program - Final Environmental Impact Statement (May 2000)	2000	737	3	2	3	3	3
DOE	Final Environmental Impact Statement for the JEA Circulating Fluidized Bed Combustor Project, Jacksonville, Florida (June 2000)	2000	469	13	25	26	26	26
DOE	National Ignition Facility Final Supplemental Environmental Impact Statement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (January 2001)	2001	444	1	0	0	0	0
DOE	Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Waste Radioactive Waste at Yucca Mountain, Nye County, Nevada (February 2002)	2002	4793	167	282	289	291	291
DOE	Idaho High-Level Waste & Facilities Disposition, Final Environmental Impact Statement (September 2002)	2002	1834	60	111	112	112	112
DOE	The Savannah River Site High-Level Waste Tank Closure Final Environmental Impact Statement, (May 2002)	2002	527	27	44	44	44	44
DOE	Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project Final Environmental Impact Statement (November 2002)	2002	638	35	25	29	29	29
DOE	Proposed Relocation of Technical Area 18 Capabilities and Materials at the Los Alamos National Laboratory, Final Environmental Impact Statement (August 2002)	2002	724	74	242	301	301	301
DOE	Bonneville Power Administration Fish & Wildlife Implementation Plan Final EIS (April 2003)	2003	1187	12	5	5	5	5
DOE	Sacramento Area Voltage Support Project Final Environmental Impact Statement (September 2003)	2003	200	16	24	24	24	24
DOE	Environmental Impact Statement for Schultz-Hanford Area Transmission Line Project, (January 2003)	2003	913	14	10	12	12	12
DOE	West Valley Demonstration Project Waste Management Final Environmental Impact Statement (December 2003)	2003	410	5	4	4	4	4
DOE	Final Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico	2003	541	68	215	233	232	232
DOE	Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement Richland, Washington (January 2004)	2004	3879	37	26	34	34	34

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<b>Environmental Impact Statements (EIS)</b>				<i>Total Count of Terms</i>				
<b>Agency</b>	<b>Title</b>	<b>Year</b>	<b>No. of pages</b>	<b>EJ</b>	<b>Population</b>	<b>Site</b>	<b>Impact</b>	<b>Response</b>
DOE	Wanapa Energy Center Final Environmental Impact Statement (December 2004)	2004	484	9	5	6	6	6
DOE	BP Cherry Point Cogeneration Project Final Environmental Impact Statement (August 2004)	2004	729	0	0	0	0	0
DOE	Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky, Site (June 2004)	2004	868	64	62	69	74	74
DOE	Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at Portsmouth, Ohio, Site (June 2004)	2004	831	73	69	76	81	81
DOE	Final Environmental Impact Statement for the Imperial-Mexicali 230-kV Transmission Lines (December 2004)	2004	1185	37	93	97	97	97