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INTRODUCTION

By definition, effect-based health, safety, and environmental regulation depends upon information about the effects on health, safety, or the environment of particular substances or activities.[1] How much and what information the regulatory process demands before an activity or substance is regulated or permitted, and what provisions it makes to ensure the availability of this information are therefore critical questions. In addition, every regulatory process must either implicitly or explicitly address the question of what happens when the available informational supply fails to meet the demand the statute creates. These explicit or implicit provisions that determine the consequences of an information gap, while not appearing to affect substantive policy, can have a significant effect on what policy is, in fact, implemented.[2]

Scholars who have studied health-protective chemical regulation statutes such as the Toxic Substances Control Act (TSCA)[3] have observed that the information flow under regulatory statutes can create obstacles to protective regulation and may even distort the structure of the scientific information generated under the statute. The source of these problems in health-based regulation is frequently the combined effect of the demand for information, the inadequate supply of information, and the legal consequences that flow from a gap between data demand and supply.[4] For example, in

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1. The subject of this paper and of most inquiry concerning information demands is effect-based regulation, as opposed to technology-based regulation. One of the frequently noted advantages of technology-based regulation is the different information demands it imposes. *See generally* David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*, 32 B.C. ENVTL. AFF. L. REV. 1 (2005); Sidney A. Shapiro & Thomas O. McGarity, *Not So Paradoxical: The Rationale for Technology-Based Regulation*, 41 DUKE L.J. 729 (1991).

2. The fact that a statute depends on and demands certain information does not always mean that the information will be available or forthcoming. As Professor Wagner's work demonstrates, the identity of the party who must generate the information on which regulation depends, and the incentives and disincentives that party has to provide this information, are critical to assessing the impact of information demands on the regulatory process. *See generally* Wendy E. Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619 (2004).

3. 15 U.S.C. § 2605(a) (2006).

4. *See generally* Mary L. Lyndon, *Information Economics and Chemical Toxicity: Designing Laws to Produce and Use Data*, 87 MICH. L. REV. 1795 (1989); Wagner, *supra* note 2 (arguing that unrealistic data expectations that ignore the incentive structure for generation of the data create obstacles to protective regulation); Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613 (1995) (documenting legal, political, and

order to successfully implement a protective statutory mandate, such as the EPA's mandate to protect public health from unreasonable risks under TSCA, or the Occupational Safety and Health Acts's mandate to develop standards that are reasonably necessary or appropriate to provide safe and healthful employment,[5] an agency must first prove that a given substance causes unreasonable risks to health and then provide sufficient scientific proof that a particular quantitative standard or limitation is necessary to reduce the risk to a reasonable level.[6] Often the most probative scientific evidence on these points comprises controlled studies of animal exposure to the relevant substance. Based on this evidence, inferences are drawn about the impacts of exposure on humans.[7]

A rich literature documents how judicial interpretation of demand provisions in regulatory statutes impose unreasonable requirements on agencies, and details other obstacles agencies face in obtaining the information necessary to support protective regulation under TSCA and similar statutes. [8] Scholars have also highlighted the lack of adequate public funding for basic research[9] and the disincentives the regulatory system creates for information generation by private parties.[10] Finally, this literature documents how, under many such statutes, the consequence of an inadequate supply of information to meet the regulatory demand results in regulatory paralysis.[11] This body of work provides strong support for the conclusion that the systems of supply and demand for information under these statutes are poorly designed to achieve the goal of protecting public health and safety.

One question raised by the organizers of this symposium is whether the same obstacles to protective regulatory decisions exist under statutes that mandate protection of natural resources, as opposed to public health. This paper focuses on a public trust resource—wetlands—and examines an issue that has been studied primarily with reference to health-based pollution-control statutes. This paper assesses whether information gaps create an obstacle to successful regulation under section 404 of the Clean Water Act (CWA or "the Act") as it applies to discharges of dredged and fill material in wetlands.[12]

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institutional hurdles to protective regulatory decision making that create pressure for unattainable scientific certainty). This dynamic is not limited to TSCA. Other health-based pollution control statutes create the same dynamic.

5. Occupational Safety and Health Act (OSHA) of 1970, 29 U.S.C. § 652(8) (2006).

6. This approach is derived from the Supreme Court's decision in *Industrial Union Department v. American Petroleum Institute*, 448 U.S. 607, 614–15 (1979). *See also* Corrosion Proof Fittings v. EPA, 947 F.2d 1201, 1223 (5th Cir. 1991).

7. *See* Wagner, *supra* note 4. While highly relevant, epidemiological studies are often not available.

8. *See generally* Howard Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89 (1988); Shapiro & McGarity, *supra* note 1; Wagner, *supra* note 2; Wagner, *supra* note 4.

9. Wagner, *supra* note 2, at 1744–45.

10. *Id.* at 1678 (adverse regulatory consequences may ensue if regulated entities generate relevant information).

11. These consequences may be explicit or implicit in the regulatory text. They may result from the allocation of the burden of proof or the quantum of proof required to support regulatory action. *See infra* Part III.A.3.

12. Section 404 applies to discharges of dredged and fill material into waters of the United States. *See* 33 U.S.C. § 1344 (2006). Some wetlands qualify as waters of the United States. As

Against the backdrop of the literature on information demand and supply in chemical regulation, this paper evaluates the impact of information demand and supply on the success of federal regulation pursuant to section 404 of the CWA. It focuses on how section 404 and the regulations governing permitting determine information demands, information supply, and the legal consequences of a gap between supply and demand. The goal of this inquiry into the demand/supply/consequences scheme is to determine if, taken as a whole, the scheme is coherent and rational in light of the policies that underlie section 404.

Because section 404 is a unique blend of pollution control regulation and natural resource management, the protection of wetlands under section 404 provides an interesting lens through which to consider the impact of information demands. The fundamental similarity between a health-protective statute such as section 6 of TSCA[13] and section 404 is that both statutes seek to regulate activities that will introduce harmful substances into the environment. Moreover, section 404 is part of the CWA, a statutory framework that adopts primarily a pollution-control approach to achieving its goals by focusing on avoiding harmful discharges into the environment.[14] Yet protecting functions and values of wetlands is a goal related to natural resource conservation, which is generally achieved through resource management legislation.

The most obvious difference between natural resources law and pollution control law is the emphasis on the affected resources as opposed to polluting activities or substances. As Professor Fischman and others have pointed out, the distinctions between pollution control and natural resource management statutes blur at the margin.[15] Almost all environmental problems can be characterized as addressing resource protection issues, whether the resource is public land, air, or water. And many problems of natural resource management entail pollution avoidance. As such, even the names distinguishing these realms ultimately prove unsatisfactory. Yet scholars and practitioners typically focus on only one of the two realms and remain largely ignorant

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is described further *infra* note 183 and accompanying text, wetlands receive special treatment under the EPA's 404(b)(1) guidelines as a species of "special aquatic site." Where the regulations treat discharges into wetlands differently from those into other waters, this paper focuses on the rules applicable to discharges in jurisdictional wetlands.

13. This section requires the EPA to impose regulatory requirements on the "manufacture, processing, distribution in commerce, use, or disposal of a chemical substance or mixture . . . that presents or will present an unreasonable risk of injury to health or the environment . . . to the extent necessary to protect adequately against such risk, using the least burdensome requirements . . . ." 15 U.S.C. § 2605(a) (2006).

14. Section 404 of the CWA is unusual in that its roots lie in the Corps of Engineers's section 10 program under the Rivers and Harbors Act of 1899, originally implemented to protect the navigability of the nation's waters by avoiding the introduction of obstructions. The approach embodied in section10 seems best characterized as akin to a pollution control approach. It undertook to keep certain types of obstructions out of navigable waters rather than establishing a process aimed at preserving the resource. The scope of section 10 was later recognized to also encompass activities outside navigable waters but that have an effect on navigability. *See* United States v. Sexton Cove Estates, Inc., 526 F.2d 1293, 1299–300 (5th Cir. 1976); Weiszmann v. Dist. Eng'r, U.S. Army Corps of Eng'rs, 526 F.2d 1302, 1305 (5th Cir. 1976); United States v. Perma Paving Co., 332 F.2d 754, 757–58 (2d Cir. 1964).

15. *See generally* Robert L. Fischman, *Cooperative Federalism and Natural Resource Law*, 14 N.Y.U. ENVTL. L.J. 179 (2005); Robert L. Glicksman, *Pollution on the Federal Lands I: Air Pollution Law*, 12 UCLA J. ENVTL. L. & POL'Y. 1, 4–6 (1993).

of what occurs in the other.[16] More than inherent differences in the nature of the problems addressed, the differences between the two realms may reflect differences in the identified goals for government action and related decisions about how to regulate. These inhere not in the nature of the resource or even the phenomena that prompt regulation, but in our legal framework for conceiving of the relevant resource, and our attitudes and decisions about what constitutes the problem, along with the best way to approach the problem.

One distinction in defining the problem is that pollution control tends to focus on *human health* protection, while natural resource management focuses on protecting a broader array of *environmental values*. This is accurate to a point and an important distinction. Most natural resource management statutes focus on environmental values primarily, and only secondarily on human health protection. However, even paradigmatic pollution control statutes such as the Clean Water Act focus on the integrity of the environment as well as human health.[17] And the Clean Air Act grants the EPA authority to address air pollution's effects on the environment.[18]

Although not perfect, this distinction is nonetheless important and useful. It helps to explain why the information regimes under the two types of statutes may differ significantly. Although some of the same problems that bedevil the use of information under health protective statutes also impede the use of information under environment-focused statutes, important differences flow from a focus primarily on human health as opposed to the environment. Many important problems with the collection and use of scientific information under health protective statutes are unique artifacts of the scientific methods for determining the risk of cancer posed by a substance, a concern measured and assessed using highly specialized methods very different from those used for predicting depletion of a natural resource like timber or species.[19]

Another distinction that is helpful to understanding the difference in the two realms is the ownership of the resource at issue. Professor Fischman has noted that the dividing line between the realms of natural resources and pollution control law may be whether authority for regulation arises from the Constitution's Property Clause or the Commerce Clause.[20] Where the government is treated by the legal system as owning the resource and thus acts under the Property Clause, the predominant legal framework employed is a natural resource management approach.[21] This makes sense since the public interest is at its strongest, and the government is the owner of the resource, not just the sovereign regulating commerce. Where the resource is affected with the public trust, as with endangered species and wetlands, Congress has typically adopted a hybrid natural resource management/ pollution control approach.[22] This approach

16. *See* Fischman, *supra* note 15, at 194.

17. 33 U.S.C. § 1251(a) (2006).

18. 42 U.S.C. §§ 7401, 7409(b) (2006).

19. *See* Wendy E. Wagner, *The "Bad Science" Fiction: Reclaiming the Debate over the Role of Science in Public Health and Environmental Regulation*, 66 LAW & CONTEMP. PROBS. 63, 65–66 (2003).

20. *See* Fischman, *supra* note 15, at 193; Robert L. Fischman, *The Divides of Environmental Law and the Problem of Harm in the Endangered Species Act*, 83 IND. L.J. 1, 21–24 (2008).

21. Fischman, *supra* note 20, at 22.

22. *Id.* at 6–7.

reflects the public trust interest held by the government, a less-extensive federal property interest. Finally, where the resource is treated as unowned or available for some or all to claim, as with air or water in which rights have not been allocated, the government acts under its Commerce Clause authority and a pollution control approach has predominated.[23] Taken together, these distinctions have considerable explanatory power.[24]

Finally, and perhaps of greatest significance, section 404 represents a fundamentally different regulatory structure from the rulemaking model employed in many health-focused statutes. Section 404, like many natural resource management statutes, employs a permitting scheme in which proposed activities are reviewed according to regulatory standards and permission is individually granted or denied.[25] In light of these several important differences—section 404's predominant focus on environmental quality and not public health, wetlands' status as a public trust resource, and the reliance on a permitting mechanism rather than rulemaking—it is not surprising that the analysis of section 404's information regime reveals a fundamentally different interaction among information demand, supply, and the consequences that flow from any information gap from that found in the context of chemical regulation. Unlike chemical regulation, where a combination of unrealistic demands and inadequate supply produces regulatory paralysis, the picture that emerges from the wetlands permitting process is quite different and somewhat more complex. Although different, the information regime under section 404 reveals its own problems. Provisions that assign the permitting agency considerable discretion over the information supplied by permit applicants and conflicting provisions that create ambiguity and grant the agency discretion over the consequences of insufficient proof in the context of the permitting process add up to a poor design for achieving the statutory purposes.

Part I provides an overview of the relevant statutory and regulatory provisions and identifies to the extent possible the goals section 404 was enacted to advance. Part II then provides some facts regarding wetlands loss and the section 404 permitting

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23. *Id.* at 21.

24. A counterexample is the ambient air quality standards and state implementation plans under the Clean Air Act, which arguably represent an instance of natural resource management planning of an unowned open access resource.

25. This paper focuses solely on the regulatory provisions that guide a determination on whether to issue an individual permit, as distinct from those that determine whether a permit is needed, and what mitigation must be performed to offset any adverse impacts. Provisions related to the scope of jurisdiction under section 404, general permits, exclusions, and mitigation requirements also create information demands and supply, which are largely independent from those I examine. For example, the lack of monitoring of mitigation efforts, lack of data on watershed and cumulative impacts of proposed activities, and the limited information relied on to issue nationwide general permits all may be occasions where an inadequate supply of information interferes with achieving the statutory purposes.

The scope of federal jurisdiction is also an issue of controversy, most recently addressed by the Supreme Court in *Rapanos v. United States*, 126 S. Ct. 2208 (2006). This article does not address the interesting question of information demands created by the tests for jurisdiction, including those raised by the *Rapanos* decision. *See generally* Alyson C. Flournoy, *Section 404 at Thirty-Something: A Program in Search of a Policy*, 55 ALA. L. REV. 607, 622–30 (2004) for a pre-*Rapanos* summary of the jurisdictional controversy.

process, suggesting that there is cause for concern about how well section 404 is achieving its goals. Part III looks at the permitting process in more detail, with a particular focus on the flow of information and analyzes how well the demand/supply/consequences scheme fits with the goals of section 404.

I. THE REGULATORY DECISION MAKING PROCESS UNDER SECTION 404

A. Section 404 of the Clean Water Act and Related Provisions

Section 101 of the Clean Water Act sets overarching objectives, goals, and policies for the entire Act, including section 404, and is frequently cited by courts as they try to interpret provisions of the Act. This objective of the Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[26] To achieve that objective, Congress enumerated various goals. Discharges into wetlands tend to undermine these goals.[27]

Against this backdrop, section 301 of the CWA imposes a broad prohibition on all discharges into navigable waters. [28] Activities authorized pursuant to section 404 are one of the exceptions to that broad prohibition. Section 404(a) authorizes the Secretary of the Army to "issue permits, after notice and opportunity for public hearings for the discharge of dredged or fill material into the navigable waters at specified disposal sites" including wetlands that fall within the jurisdictional reach of the CWA.[29] Under section 404(a), Congress accords the Secretary of the Army broad discretion to issue permits for discharges into wetlands, thus softening the apparent protective force of section 301. Absent a permit, however, discharges of dredged and fill material into wetlands remain prohibited.

The objectives of section 404 are not defined with precision and are subject to some debate.[30] To understand the purposes of section 404 requires examining it in the

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26. 33 U.S.C. § 1251(a) (2006); *See also* Robert W. Adler, *The Two Lost Books in the Water Quality Trilogy: The Elusive Objectives of Physical and Biological Integrity*, 33 ENVTL. L. 29, 32–33 (2003).

27. The goals are: elimination of the discharge of pollutants into navigable waters by 1985 and attaining, wherever possible, water quality adequate for protection and propagation of fish, shellfish, and wildlife and for recreation by 1983. 33 U.S.C. § 1251(a)(1)–(2) (2006).

28. Section 301(a) provides that, "Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful." 33 U.S.C. § 1311(a) (2006).

29. 33 U.S.C. § 1344(a) (2006). This delegation of authority to the Corps, rather than the EPA, which administers most of the other pollution control permitting under the CWA, exists for two reasons. First, the Corps administered the precursor wetlands program under the Rivers and Harbors Act of 1899, which the CWA was intended to expand. Congress was "uniquely aware of the process" and did not want to create "a burdensome bureaucracy." 118 CONG. REC. 33,699 (1972). Second, the Corps and its backers "did not want the extensive Corps dredge and fill activities to be regulated by an agency other than the Corps." WILLIAM L. WANT, LAW OF WETLANDS REGULATION, §2:7 (2007). The standards that governed the Corps's issuance of permits under the Rivers and Harbors Act and that carry over into its regulatory program today are discussed later in this article. *See infra* text accompanying notes 89–96.

30. *See generally* Michael C. Blumm & D. Bernard Zaleha, *Federal Wetlands Protection Under the Clean Water Act: Regulatory Ambivalence, Intergovernmental Tension, and a Call*

broader context of the statute. Scholars disagree about whether section 404 applies to activities in wetlands generally or only to those in traditional waterbodies. Some scholars contend that Congress always intended to regulate wetlands independent of the CWA,[31] while others argue that the legislative debates clearly illustrate Congress's commitment to protecting wetlands under the CWA.[32] Professor Michael Blumm argues that the legislative history of section 404 demonstrates that Congress intended to assert federal jurisdiction broadly over any waters that could be regulated under the Commerce Clause, including wetlands.[33] In *Natural Resources Defense Council, Inc. v. Callaway*,[34] a federal district court held that "navigable waters" does not mean only those traditionally deemed navigable, but is expanded under section 404 to the "maximum extent permissible under the Commerce Clause."[35] The Supreme Court's decision in *United States v. Riverside Bayview Homes, Inc.*[36] upheld the Corps's definition of waters of the United States, which included those wetlands with actual or potential effect on interstate commerce, even if not inundated or frequently flooded by a navigable water.[37]

However, there are those who argue that section 404 protection of wetlands is a "regulatory program run amuck"[38] and that the term "navigable waters," as retained from the Rivers and Harbors Act,[39] should carry its plain meaning.[40] Justice Kennedy's governing opinion in *Rapanos v. United States*,[41] while raising many questions, adopts a middle ground, reading section 404 as granting jurisdiction over activities in waters that are or were navigable in fact or that could reasonably be made navigable, as well as those with a "significant nexus" to such waters.[42]

Regardless of how this issue is further clarified, it is clear that for activities within the Corps's jurisdiction, section 404(b) imposes a limit on the Corps's authority to issue permits. It provides:

> Subject to subsection (c) of this section, each such disposal site shall be specified for each such permit by the Secretary (1) through the application of guidelines

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for Reform, 60 COLO. L. REV. 695 (1989); Sam Kalen, *Commerce to Conservation: The Call for a National Water Policy and the Evolution of Federal Jurisdiction over Wetlands*, 69 N.D. L. REV. 873 (1993); Vickie V. Sutton, *Wetlands Protection—A Goal Without a Statute*, 7 S.C. ENVTL. L.J. 179 (1998).

31. *See* Sutton, *supra* note 30 at 179, 186.

32. *See* Kalen, *supra* note 30, at 897–905.

33. Michael C. Blumm, *The Clean Water Act's Section 404 Permit Program Enters Its Adolescence: An Institutional and Programmatic Perspective*, 8 ECOL. L.Q. 409, 416 n.25 (1980).

34. 392 F. Supp. 685, 686 (D.D.C. 1975).

35. *Id.* at 686; Kalen, *supra* note 30, at 893.

36. 474 U.S. 121 (1985).

37. *Id.* at 134–35.

38. Sheila Deely & Mark Latham, *The Federal Wetlands Program: A Regulatory Program Run Amuck*, DAILY ENV'T REP., Apr. 22, 2003, at B1.

39. 33 U.S.C. § 403 (2006).

40. Sutton, *supra* note 30, at 190–92 (concluding that because the CWA uses "navigable waters" as a jurisdictional basis, the statute is an inappropriate grounding for wetlands regulation).

41. 126 S. Ct. 2208 (2006).

42. *Id.* at 2236.

> developed by the Administrator, in conjunction with the Secretary, which guidelines shall be based upon criteria comparable to the criteria applicable to the territorial seas, the contiguous zone, and the ocean under section 1343(c) of this title . . . .[43]

This provision clearly constrains the Corps to issue permits pursuant to guidelines designed to avoid or restrict degradation of a wide array of values and functions associated with waters including wetlands. This concern for protection of conservation values resonates with the overall purpose of the Act. These same values are echoed by section 404(c), which authorizes the Administrator of the EPA to veto a section 404 permit whenever the Administrator determines that the proposed discharge will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas.[44]

This paper starts, therefore, from the premise that a goal of section 404 is to preclude unacceptable degradation of the values and functions of all wetlands that fall within CWA jurisdiction and to ensure consideration of the non-economic values and services that these wetlands provide, as well as the economic value of discharges of dredged and fill material for navigation and anchorage.[45] As is explored in greater detail below, how much degradation is "unacceptable" remains an open question under the statute.[46] However, the requirement that the Corps assess the degrading impact of proposed discharges and only grant permits in conformity with anti-degradation guidelines would make no sense unless Congress had concluded that *some* degree of degradation would be unacceptable.[47]

Nonetheless, section 404 itself provides very limited guidance as to the precise standard that should govern the Secretary's decision to issue permits for discharges. Section 404(b) provides the only real guidance as to the substantive standard to be applied under the statute.[48] It requires the Secretary to specify the disposal sites for discharges of dredged and fill material "through the application of guidelines" to be developed by the Administrator of the EPA and the Secretary, "which . . . shall be based upon criteria comparable to the criteria applicable to the territorial seas, the contiguous zone, and the ocean under section 1343(c) of this title . . . ."[49] Thus, the

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43. 33 U.S.C. § 1344(b) (2006).

44. 33 U.S.C. § 1344(c) (2006). This veto power has been invoked by the EPA in only a small number of cases. *See, e.g.*, Final Determination Concerning Three Wetland Properties, 53 Fed. Reg. 30,093 (Aug. 10, 1988); Final Determination Concerning the Bayou Aux Carpes Site, 50 Fed. Reg. 47,267 (Nov. 15, 1985); Final Determination Concerning the Jack Maybank Site, 50 Fed. Reg. 20,291 (May 15, 1985); Final Determination Concerning the M.A. Norden Site, 49 Fed. Reg. 29,142 (July 18, 1984); Final Determination Concerning the North Miami Landfill, 46 Fed. Reg. 10,203 (Feb. 2, 1981).

45. 33 U.S.C. § 1343(c)(1)(C) (2006).

46. The EPA's guidelines employ the phrase "unacceptable adverse effects." *See infra* Part III.B.1(a)(i).

47. The EPA's regulations are consistent with this interpretation. *See id.*

48. The only other arguably substantive standard is found in section 404(f), which enumerates certain exceptions to the prohibition on non-permitted discharges. 33 U.S.C. § 1344(f) (2006).

49. 33 U.S.C. § 1344(b)(1) (2006). Section 404(b)(2) also mandates consideration of the economic impact of any proposed discharge on navigation and anchorage if disposal would

ultimate standard that governs permit issuance will be determined by the guidelines, which in turn will be based on criteria comparable to those set forth in section 1343(c).

In turn, 33 U.S.C. § 1343(c), referenced in section 404(b)(1), directs the EPA to develop guidelines "for determining the degradation" of the waters of the territorial seas, the contiguous zone, and the oceans.[50] In full, section 1343(c) provides:

> (1) The Administrator shall . . . promulgate guidelines for determining the degradation of the waters of the territorial seas, the contiguous zone, and the oceans, which shall include:
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> (A) the effect of disposal of pollutants on human health or welfare, including but not limited to plankton, fish, shellfish, wildlife, shorelines, and beaches;
>
> (B) the effect of disposal of pollutants on marine life including the transfer, concentration, and dispersal of pollutants or their byproducts through biological, physical, and chemical processes; changes in marine ecosystem diversity, productivity, and stability; and species and community population changes;
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> (C) the effect of disposal, of pollutants on esthetic, recreation, and economic values;
>
> (D) the persistence and permanence of the effects of disposal of pollutants;
>
> (E) the effect of the disposal at varying rates, of particular volumes and concentrations of pollutants;
>
> (F) other possible locations and methods of disposal or recycling of pollutants including land-based alternatives; and
>
> (G) the effect on alternate uses of the oceans, such as mineral exploitation and scientific study.
>
> (2) In any event where insufficient information exists on any proposed discharge to make a reasonable judgment on any of the guidelines established pursuant to this subsection no permit shall be issued under section 1342 of this title.[51]

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otherwise be precluded under the water quality guidelines. *See id.* § 1344(b)(2). The section provides that if application of the criteria prohibits specification of a disposal site, the Secretary must also specify the disposal site "through the application additionally of the economic impact of the site on navigation and anchorage." *Id.* This somewhat awkward phrasing seems to require that if the Secretary concludes that any given disposal site should be prohibited under the guidelines, he must then also consider the economic impact on navigation and anchorage of denying disposal at that particular site. This reinforces the Corps's traditional interest in protecting navigation.

50. *Id.* § 1343(c)(1).

51. *Id.* § 1343(c).

These section 403(c) criteria[52] take account of the effects of disposal of pollutants on a wide array of life forms,[53] and mandate consideration of various qualities of disposal,[54] and the effects of disposal of pollutants into the waters on a wide array of values. These values include human health and welfare; esthetic, recreation, and economic values; and alternate uses of the ocean, such as mineral exploitation and scientific study.[55] Thus, the reference in section 404(b)(1) to section 403(c) must reflect congressional concern with degradation of a wide variety of values associated with water, but it fails to provide a clear standard to govern agency decision making. The net effect of section 404(b) is therefore to grant the Corps broad discretion to issue permits and to mandate that the EPA and the Corps develop anti-degradation guidelines to govern issuance of permits. Congress left more precise articulation of the standard for permit issuance to the agencies in their development of guidelines.

The structure of section 404 provides the Corps far more discretion than many other CWA permitting provisions which prohibit activities unless certain standards are complied with.[56] Thus an important attribute of section 404 is the range of discretion it leaves to the agencies to develop guidelines, and the discretion implicitly accorded to the Corps by constraining it only to apply these "guidelines."[57]

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52. Section 404(b)(1) mandates development of guidelines based upon "criteria comparable to the criteria" applicable under section 403(c). *Id.* § 1344(b)(1). However, section 403(c) itself does not contain anything that can readily be called criteria. *See id.* § 1343(c). The word "criteria" denotes a standard of judgment, or a rule or principle for evaluating or testing something. THE RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE 477 (2d ed. 1987). Section 403(c) provides a list of factors for consideration, but not true "criteria" for decision. *See* § 1343(c). It may be that Congress assumed that the guidelines developed under section 403(c) would include something that could fairly be called criteria for decisions. If this reading is accurate, the text of section 404(b) mandates the development of guidelines based on criteria comparable to those that Congress expected the EPA would develop in its section 403(c) guidelines.

53. *Id.* § 1343(c)(1)(A)–(B).

54. These include the persistence and permanence of any effects, the particular volume, and concentration of the disposal. *Id.* § 1343(c)(1)(D).

55. *Id.* § 1343(c)(1)(A), (C), (G). The criteria also specifically require consideration of "other possible locations and methods of disposal or recycling of pollutants including land-based alternatives . . . ." *Id.* § 1343(c)(1)(F).

56. *See e.g. id.* § 1342(a) (authorizing permits "upon condition that such discharge will meet . . . all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title . . . ."). All of the sections contain clear directives of what shall and shall not be approved, permitted, established, or required, etc. While the provisions allow the Administrator judgment or discretion, the criteria for such judgment and discretion are relatively clear.

57. The term guidelines suggests a less mandatory and clear set of restrictions as compared with a term like "requirements" or even the generic term "regulations." Moreover, rather than mandating "compliance" with guidelines, Congress directed that permits be issued "through application" of the guidelines, another phrasing that is imbued with discretion. Nonetheless, courts and the Corps all recognize that these guidelines have the force of law. *See* Michael J. Mortimer, *Irregular Regulation Under Section 404 of the Clean Water Act: Is the Congress or the Army Corps of Engineers to Blame?*, 13 J. ENVTL. L. & LITIG. 445, 464–65 (1998).

B. The EPA's and Corps's Regulations

For our inquiry, the three key components of section 404 are (1) its delegation of authority to the Corps to issue individual permits,[58] (2) its requirement that permits be issued through application of guidelines, and (3) its direction that the guidelines be based on criteria comparable to section 403(c) of the CWA. In light of our focus on information demand, supply, and consequences in the implementation of section 404, the 404(b) guidelines are critical components of the permitting regime.

The Corps and EPA share authority in a unique arrangement under section 404. Congress authorized the Corps to issue permits for discharges of dredged and fill material as an adjunct to the Corps's historic authority to protect navigation under the Rivers and Harbors Act of 1899, but the discharges must be in compliance with guidelines that EPA and the Corps are charged with developing. The Corps implements the permitting program, but EPA is charged with helping to develop the guidelines mandated by section 404(b)(1).[59] The EPA has developed extensive regulations pursuant to 404(b)(1), commonly referred to as the EPA's water quality or 404(b)(1) guidelines.[60] In addition to these regulations, the Corps of Engineers has developed regulations to govern the permitting process and to effectuate both its mission to preserve navigation and to consider a broad array of values affecting the public interest.[61]

For purposes of this Article, the pertinent question is the extent to which the agencies' regulations create information demands, generate information supply, and the legal consequences that follow when a gap exists between demand and supply. This Section describes some of the characteristics of the permitting process and then provides a brief introduction to the EPA's and Corps's regulations that govern permit issuance.

1. Characteristics of the Permitting Process

A central attribute of section 404 is its structure as a grant of authority to the Corps to issue individual permits.[62] This creates a substantially different information dynamic than does a rulemaking process. First, an agency engaged in a licensing or permitting procedure must define what constitutes a complete application for the license or

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58. Section 404 delegates this authority to the Secretary of the Army which has in turn delegated the authority to the Corps of Engineers. For simplicity, I will refer to the Corps as the delegee, rather than the Secretary.

59. The statute requires that the Corps apply EPA's guidelines in issuing permits, and that it also consider the economic impacts on navigation for any activity that would be prohibited under the guidelines. 33 U.S.C. § 1344(b)(2) (2006). EPA is also given a veto over selection of a disposal site. This veto power under section 404(c) is predicated on a finding of "unacceptable adverse effects on municipal water supplies, shellfish beds and fishery areas, . . . wildlife, or recreational areas." 33 U.S.C. § 1344(c).

60. These regulations are found at 40 C.F.R. Part 230.

61. Mortimer, *supra* note 57, at 464–65 (1998) (describing the origins of the Corps public interest review and its inconsistency with the goals of the CWA).

62. States can request and receive delegated authority to issue permits pursuant to section 404. 33 U.S.C. § 404(g)–(h) (2006). This discussion will refer to the Corps as the permitting authority for simplicity.

permit. This means that the agency has the opportunity to create a well-defined set of information demands for permit applicants. Applicants expect to bear the burden of coming forward with required information. In addition, the agency must establish relatively clear standards governing permit issuance as an element of due process.[63] If the required information is provided, applicants can expect that a permit decision will be made based on the stated criteria.

Another characteristic of an individual permitting process is that it may create information demands that apply to a large number of individual parties, as is true under section 404. Thus, information demands are amplified by the number of individual decisions. The costs of information demands—whether the burden of these demands falls on applicants or the agency—can become cumulatively significant.

Another feature common to many individual permitting schemes including section 404 is that the decisions are highly localized and numerous. In addition, as with many discharges subject to permitting under the Clean Water Act, discharges into wetlands typically have concentrated benefits for the applicant. Adverse effects will often be diffuse and difficult to detect, and may be individually insignificant but cumulatively significant. Therefore, the effects of a proposed discharge often will be experienced by parties who are not aware of the permit proceeding or of its potential effects on their interests.

The diffuse, localized, and incremental nature of the impacts and the numerous proceedings mean that relatively few permit proceedings are monitored by any person or organization whose primary concern is to advocate for the public interest. With the exception of proposals affecting a very large area or an area of exceptional ecological significance, applications are unlikely to generate involvement by large public interest organizations. Neighbors of a proposed activity area, or local or regional environmental organizations may become involved where they learn of projects with significant impacts. However, such groups often lack the resources to participate in all decisions in which they may have an interest. Thus, the vast majority of the applications that may contribute to cumulatively significant impacts will be uncontested.

This means that the permitting process will frequently be a one-party proceeding. Consequently, the Corps's role as the only party likely to ferret out information on adverse impacts takes on greater significance. However, as the Corps makes clear in its regulations, it envisions itself in the role of neutral arbiter of the proposal. In its regulations, the Corps states that "[t]he Corps is neither a proponent nor opponent of any permit proposal."[64] In other words, the Corps merely evaluates the proposal for compliance. Although the Corps applies at a minimum a standard that is grounded in avoiding proposed discharges that are "contrary to the public interest,"[65] the Corps is not the advocate of the public interest. The Corps's neutral role in the proceeding may significantly affect the information dynamics.

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63. The Due Process Clause requires licensing decisions to be based upon established standards, rather than upon the whim of the licensor. *See* Yick Wo v. Hopkins, 118 U.S. 356, 370 (1886); GE Co. v. N.Y. State Dep't of Labor, 936 F.2d 1448, 1454–55 (2d Cir. 1991); Hornsby v. Allen, 326 F.2d 605, 608 (5th Cir. 1964).

64. 33 C.F.R. § 320.1(a)(4) (2007).

65. *Id.* § 320.4(a)(1).

2. The EPA's Section 404(b)(1) Water Quality Guidelines

Within the context of the 404 permitting process described above, the water quality guidelines play a central role. They contain the most clearly articulated standards, which the Corps applies to distinguish permissible from impermissible activities. The guidelines begin in § 230.1 of the Code of Federal Regulations by setting out the purposes and policies of the water quality guidelines. This provision echoes the purposes set forth in section 101 of the Clean Water Act, stating that the purpose of the guidelines is "to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material."[66]

Following this broad introduction, § 230.1(c) and (d) provide, respectively, what the guidelines term a "fundamental precept" and a "guiding principle":

> (c) Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern.
>
> (d) From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.[67]

Together, these express something close to a presumption against discharges into wetlands.[68]

The EPA's water quality guidelines do not create specific standards that directly govern private actors' conduct. Instead, the regulations outline a decision-making process by which the Corps must determine whether a discharge proposed by an applicant is in compliance with the guidelines and thus eligible for a permit. Section 230.12(a) outlines the decision options for the Corps under the guidelines. These options are to specify that the proposed disposal: (1) complies with the guidelines, (2) complies with the guidelines with inclusion of appropriate and practicable conditions, or (3) fails to comply with the guidelines.[69] This last option is further defined by a list of the four circumstances that warrant a finding of noncompliance.[70]

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66. 40 C.F.R. § 230.1(a) (2007).

67. *Id.* § 230.1(c)–(d).

68. In fact, another section of the regulations refers to "[t]he presumption against the discharge in § 230.1" in the course of applying § 230.1 to decisions involving short form evaluations. *Id.* § 230.6(c). However, there is some ambiguity surrounding this so-called presumption. Specifically, the core standards for compliance found in § 230.10 are phrased as exceptions to the authority to grant a permit. *See id.* § 230.10. In other words, the presumption appears to be reversed, prohibiting issuance of a permit only if an affirmative finding is made under one of section 230.10's proscriptions.

69. *Id.* § 230.12(a)(1)–(3).

70. *Id.* § 230.12(a)(3)(i)–(iv). These are:

Pursuant to section 404's mandate that permits be issued through application of guidelines, § 230.10 imposes four conditions on the Corps's authority to grant permits. These core standards governing permit issuance in turn form the basis for a finding of compliance or failure of compliance under § 230.12. Section 230.10(a) restricts the Corps's discretion by requiring that discharges *not* be permitted "if there is a practicable alternative . . . which would have less adverse impact on the aquatic ecosystem."[71] Subsection (b) requires that permitted discharges not violate various other laws, including state water quality standards.[72] Subsection (c) proscribes permitting of discharges "which will cause or contribute to significant degradation of the waters of the United States."[73] Finally, subsection (d) precludes the granting of permits unless "appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem."[74]

As phrased, none of these restrictions on the Corps's otherwise broad discretion to grant permits is effective absent proof that the specified circumstances exist (practicable alternatives, violation of other law, significant degradation, or failure to take appropriate steps to minimize adverse impacts). Reading § 230.10 in isolation, it appears that unless a relevant affirmative finding is made on one of these four conditions, the Corps retains its authority to issue a permit.[75] However, as is noted above, § 230.1(c) appears to create an overall presumption against permitting of a discharge "unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting ecosystems of concern."[76]

(i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or

(ii) The proposed discharge will result in significant degradation of the aquatic ecosystem under § 230.10(b) or (c); or

(iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or

(iv) There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

Three of the findings warranting a denial that are set forth in § 230.12 are based on the water quality guidelines' core substantive constraints on the Corps's authority to grant permits found in § 230.10. These are discussed further; *see infra* Part III.B.1a.ii–iv. The fourth finding—insufficient information—is discussed in detail, in connection with the consequences of an information shortfall. *See infra* Part III.B.1.c.i.

71. *Id.* § 230.10(a). This is qualified by the requirement that the alternative not have other significant adverse environmental consequences.

72. *Id.* § 230.10(b). Because subsection (b) merely incorporates pre-existing legal obligations, this analysis focuses on the other three subsections.

73. *Id.* § 230.10(c).

74. *Id.* § 230.10(d).

75. As is discussed further *infra*, imposing these burdens on the Corps would tend to favor unregulated discharges. Nonetheless, the impact is not as strong as would be an affirmative *requirement* that the Corps grant a permit in the absence of an affirmative finding. Under section 404, the Corps must make an affirmative decision to grant a permit and authorize activity in most cases and there is no clear mandate that it issue any permits. *See* 33 U.S.C. § 1344 (2006).

76. 40 C.F.R. § 230.1(c). One way to reconcile the two apparently inconsistent provisions is that section 230.1 and section 230.10 impose two distinct constraints on the Corps's authority

Further, § 230.12(a)(3)(iv) provides that a proposed discharge must be deemed not to comply with the guidelines where there is not sufficient information to make a reasonable judgment as to whether the proposed discharge will comply.[77] In a joint memorandum to Corps staff, the Corps and EPA have reiterated that this is the proper allocation of the burden of proof, citing that "[t]he burden of proof to demonstrate compliance with the Guidelines rests with the applicant; where insufficient information is provided to determine compliance, the Guidelines require that no permit be issued. 40 CFR [sic] 230.12(a)(3)(iv)."[78]

Thus the guidelines seem to create opposing presumptions or burdens of proof under § 230.1 and § 230.12 on the one hand, and § 230.10 on the other. Pursuant to § 230.1, the Corps must make an overall affirmative determination that there will be no "unacceptable adverse effects" before it can issue a permit. Section 230.10, on the other hand, imposes only specific explicit constraints on the Corps's permit granting authority. It constrains the Corps's authority to issue a permit only if the Corps makes one of four affirmative findings under § 230.10. The requirement under § 230.12 that the Corps make a finding that the proposed activity complies or fails to comply with "the guidelines" echoes the structure of § 230.10, requiring a finding of failure to comply only when affirmative findings are made pursuant to the standards of § 230.10.[79] The tension between the allocation of the burden of proof in these sections and the presumption against discharges in § 230.1 is not addressed in the guidelines.

Outside of the core substantive provisions of § 230.10, a substantial portion of the EPA's guidelines are devoted to outlining the various elements of the aquatic environment that may be affected by a discharge and the characteristics and values that may be adversely affected by a proposed activity.[80] These portions of the guidelines function as a checklist for regulators rather than as specific regulatory requirements.

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to issue permits. Pursuant to section 230.1, the Corps must make an overall affirmative determination that there will be no unacceptable adverse effects before it can issue a permit. *See* 33 C.F.R. § 230.1. Section 230.10, on the other hand, imposes certain narrower, specific prohibitions—that the Corps cannot issue a permit if it makes any of the findings under 230.10. *See id.* § 230.10. One problem is that neither the term "unacceptable adverse effects" in § 230.1 nor the term "significant degradation" in § 230.10(c) is defined. Thus their relationship is unclear.

77. *Id.* § 230.12(a)(3)(iv).

78. Memorandum from Robert H. Wayland, III, Dir., Office of Wetlands, Oceans, & Watersheds, U.S. EPA & Michael L. Davis, Assistant Sec'y, Office of the Army (Civil Works), to the Field, *available at* http://www.usace.army.mil/inet/functions/cw/cecwo/reg/mou/flexible.htm.

79. Section 230.12 also makes insufficiency of information to support a reasonable judgment a separate ground for denying a permit. 40 C.F.R. § 230.12(a)(3)(iv). This would seem to suggest that a preliminary determination of the adequacy of the available information must be made, independent of the assessment of the three substantive standards.

80. *See generally id.* §§ 230.20–.54 (describing potential effects on substrate, suspended particulates/turbidity, water, current patterns and water circulation, normal water fluctuations, salinity gradients, threatened and endangered species, fish, crustaceans, mollusks and other aquatic organisms in the foodweb, other wildlife, sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, riffle and pool complexes, municipal and private water supplies, recreational and commercial fisheries, water-related recreation, aesthetics, parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves).

The guidelines list factors to be considered. On the basis of these listed potential effects, the Corps is directed to make findings on whether a discharge complies with the requirements of § 230.10, the substantive core of the water quality guidelines.[81]

3. The Corps of Engineers's Public Interest Regulations

The Corps's regulations implementing section 404 explicitly build on the Corps's regulatory program under the 1890-era Rivers and Harbors Acts.[82] Although the Corps's authority focused entirely on protecting navigation under these statutes for many years, the enactment of the Fish and Wildlife Coordination Act of 1958,[83] the National Environmental Policy Act,[84] and judicial decisions under these statutes broadened the Corps's mandate to incorporate consideration of a broader array of conservation values.[85] Even before the enactment of section 404 and the judicial confirmation of the Corps's authority and mandate to consider conservation values, the Corps had revised the regulations governing its Rivers and Harbors Act permit program to require that permit decisions rest on "an evaluation of all relevant factors, including the effect of the proposed work on navigation, fish and wildlife, conservation, pollution, aesthetics, ecology, and the general public interest."[86] Thus, conservation has long been an aspect of the Corps's interpretation of its mandate. The Corps's section 404 regulations set forth a broad, open-ended balancing test in which the Corps seeks to account for a wide array of values that affect the public interest.[87]

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81. Section 230.11 requires the Corps to determine the short- and long-term effects of each proposed discharge on the physical, chemical, and biological components of the aquatic environment. *Id.* § 230.11. The Corps must determine "the nature and degree of effect that the proposed discharge will have, individually and cumulatively," on the physical substrate; water circulation, fluctuation, and salinity; kinds and concentrations of suspended particulate/turbidity; quantity or location of contaminants; and structure and function of aquatic ecosystem and organisms. *Id.* § 230.11(a)–(g). This guideline lists various physical indicators of impact (e.g., changes in substrate elevation, water chemistry, dissolved gas levels) that must be "considered" in making these determinations but does not impose any standard of care as to any of these impacts, leaving in place § 230.10(c)'s standard of "significant degradation."

82. *See* 33 C.F.R § 320.1(a) (2007).

83. 16 U.S.C. § 662 (2006).

84. 42 U.S.C. § 4331 (2006).

85. *See, e.g.*, Zabel v. Tabb, 430 F.2d 199 (5th Cir. 1970).

86. 33 Fed. Reg. 18,670, 18,671 (Dec. 18, 1968) (setting out text of revised 33 C.F.R. § 209.120(d)). The general concept of "public interest review" appears to have been adopted from the Corps's impact assessment employed in its planning process for water resources projects. *See* 45 Fed. Reg. 62,732, 62,740 (Sept. 19, 1980) (referencing Corps Planning Process Impact Assessment to illustrate the general public interest balancing process in 33 C.F.R. § 320.4(a)(1)).

87. This non-exclusive list mentions:

> conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

The substantive core of the Corps's public interest review is found in 33 C.F.R. § 320.4, which describes the "policies" that are "applicable" to the review of all applications for Corps permits.[88] Consistent with the broad discretion granted the Corps under section 404 to issue permits, the Corps has constrained itself only to "apply" these "policies" to the review of applications. Thus the overarching framework for the Corps's public interest review maintains a "soft" regulatory framework. The regulations give the Corps broad discretion to decide which factors are relevant and how heavily they should be weighed. The regulations provide that the decision whether to issue a permit:

> will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. Evaluation of the probable impact which the proposed activity may have on the public interest requires a careful weighing of all those factors which become relevant in each particular case. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments.[89]

Thus, in place of a standard, the regulations dictate a balancing of various factors. The regulations go on to describe all the factors which may be relevant to this balancing, including factors that reflect "the national concern for both protection and utilization of important resources."[90] The Corps must identify relevant effects of the proposed activity on a wide range of values, some readily quantifiable (food and fiber production, mineral needs); some not readily susceptible to quantification (conservation, aesthetics, floodplain values); and some that are extremely broad and ambiguous (the needs and welfare of the people, land use, economics, wetlands).[91] Based on consideration of this laundry list of values, the Corps undertakes to determine whether the proposed activity would be contrary to the public interest.[92] Under the regulations, a permit will be granted unless it would be "contrary to the public interest."[93] In the case of wetlands deemed to perform functions important to the public interest, however, the presumption is reversed, and the Corps must determine whether the benefits of the proposed alteration outweigh the damage to the wetland resource.[94] Permits for discharges into wetlands deemed to perform functions important to the public interest are only granted if the benefits outweigh the damage to the wetland resource.[95]

Given the wide array of values, the difficulty of quantifying many of the values, and the challenge of computing the relative impact on the public interest across the many different values, these regulations amount to a broad grant of discretion. As one

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33 C.F.R. § 320.4(a)(1) (2007).

88. The Corps also applies the water quality guidelines. The Corps's regulations make clear that a permit will be denied if the discharge does not comply with the EPA's 404(b)(1) guidelines. *Id.*

89. *Id.*

90. *Id.*

91. *Id.*

92. *Id.*

93. *Id.*

94. *Id.* § 320.4(b)(4).

95. *Id.*

commentator has described it, the Corps's public-interest review "reads like a parody of standardless administrative choice."[96] The net result of this lack of a standard is to preserve the Corps's broad discretion to issue or deny permits and to make a successful challenge to the Corps's public interest review difficult.

II. WETLANDS LOSS IN THE UNITED STATES: CAUSE FOR CONCERN

There is widespread agreement that wetlands serve important values.[97] Wetlands perform an often-recited list of functions that are clearly valuable to humans. These include: maintaining fish and wildlife habitat; providing essential breeding and nursery areas for many species including economically important shellfish; protecting water supply through recharge; protecting water quality through purification; providing flood control; protecting shorelines from erosion by binding stream banks and absorbing wave energy; establishing outdoor recreation opportunities for hunters and bird and wildlife watchers; and providing education and research benefits.[98] In addition, the loss or degradation of wetlands often produces degradation of other waters.[99]

There is ample basis for concern over whether the section 404 program is operating effectively as the primary federal regulatory check on degradation of wetlands.[100] Each administration since President George H.W. Bush has embraced a policy of preventing net loss of wetlands.[101] To the extent that we are still losing wetlands, it is appropriate

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96. 2 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW: AIR AND WATER § 4.12, at 205 (1986); *see also* Ellen K. Lawson, *The Corps of Engineers' Public Interest Review Under Section 404 of the Clean Water Act: Broad Discretion Leaves Wetlands Vulnerable to Unnecessary Destruction*, 34 WASH. U. J. URB. & CONTEMP. L. 203, 227 (1988); Mortimer, *supra* note 57, at 446.

97. See Flournoy, *supra* note 25 at 636–37.

98. *See* MARK S. DENNISON & JAMES F. BERRY, WETLANDS: GUIDE TO SCIENCE, LAW AND TECHNOLOGY 55–63 (1993); WORLD WILDLIFE FUND, STATEWIDE WETLANDS STRATEGIES: A GUIDE TO PROTECTING AND MANAGING THE RESOURCE 4–6 (1992); *A Presidential Wetlands Debate*, NAT'L WETLANDS NEWSL. (Envtl. Law Inst., Wash., D.C.), May–June 1992, at 5 (quoting presidential candidate George H.W. Bush in 1992 describing some of these important functions of wetlands).

99. *See* EARTHJUSTICE, NAT'L WILDLIFE FED'N, NATURAL RES. DEF. COUNCIL & SIERRA CLUB, RECKLESS ABANDON: HOW THE BUSH ADMINISTRATION IS EXPOSING AMERICA'S WATERS TO HARM (2004), *available at* http://www.nwf.org/wildlife/pdfs/RecklessAbandon.pdf; NAT'L WILDLIFE FED'N & NATURAL RES. DEF. COUNCIL, WETLANDS AT RISK—IMPERILED TREASURES 2 (2002), http://www.nrdc.org/water/conservation/atrisk/wetlands.pdf.

100. Section 404 is not the only check on wetlands loss. Non-regulatory federal subsidy programs and state regulatory programs designed to limit conversion of wetlands to farmland or to purchase wetlands also exist; however, much degrading activity falls outside these programs' scope.

101. *See* Advance Notice of Proposed Rulemaking on the Clean Water Act Regulatory Definition of "Waters of the United States," 68 Fed. Reg. 1991 (Jan. 15, 2003) (soliciting suggestions from the public on how to change the definition of "waters" so that more areas are protected under section 404); Michael C. Blumm, *The Clinton Wetlands Plan: No Net Gain in Wetlands Protection*, 9 J. LAND USE & ENVTL. L. 203, 204 (1994); WHITE HOUSE OFFICE ON ENVTL. POLICY, PROTECTING AMERICA'S WETLANDS: A FAIR, FLEXIBLE, AND EFFECTIVE APPROACH (1993), *available at* http://www.wetlands.com/fed/aug93wet.htm [hereinafter A FAIR, FLEXIBLE, AND EFFECTIVE APPROACH]. The no net loss policy explicitly envisions loss of

to inquire whether section 404 is achieving its intended purposes. Thus, the pace of wetlands destruction in the United States provides one piece of evidence regarding the impact of section 404.

Despite progress in the regulatory protection of wetlands, the pace of wetlands loss remains significant, the losses steady even if incremental.[102] However, the most recent study by the U.S. Fish and Wildlife Service shows that mitigation efforts are more than offsetting the acreage lost each year.[103] Thus, we appear to be meeting the national policy of no "net" loss of wetlands. However, this same report cautions that much of the acreage lost was vegetated freshwater wetlands, a type of wetlands that possess a wide range of values and functions.[104] In contrast, much of the gain reported came from freshwater pond acreage.[105] While ponds are valuable, the report notes that open water ponds "would not be expected to provide the same range of wetland values and functions as a vegetated freshwater wetland."[106]

The facts and figures on wetlands loss tell a story of rapid destruction in the middle of the twentieth century, slowed by enactment of both section 404 and incentive programs during the latter part of the century.[107] The pace of loss varies across the

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wetlands, but only when the losses are offset by gains of wetlands through creation. *Id.* Under current policies, a commitment to preserve or restore existing wetlands may be counted as "gains" that offset losses of wetlands. *Id.*

102. *See* THOMAS E. DAHL, U.S. FISH & WILDLIFE SERV., STATUS AND TRENDS OF WETLANDS IN THE CONTERMINOUS UNITED STATES 1986 TO 1997, 30–34 (2000), http://training.fws.gov/library/Pubs9/wetlands86-97_lowres.pdf [hereinafter 2000 STATUS AND TRENDS].

103. THOMAS E. DAHL, U.S. FISH & WILDLIFE SERV., STATUS AND TRENDS OF WETLANDS IN THE CONTERMINOUS UNITED STATES 1998 TO 2004, 15 (2006), http://wetlandsfws.er.usgs.gov/status_trends/national_reports/trends_2005_report.pdf [hereinafter 2004 STATUS AND TRENDS] (concluding that there has been an average annual net gain of 32,000 acres per year during the period from 1998–2004); *see* NATURAL RES. CONSERVATION SERV., NATIONAL RESOURCES INVENTORY 2002 ANNUAL NRI (2004), http://www.nrcs.usda.gov/technical/land/nri02/wetlands.pdf (finding that an average annual nationwide loss of 10,000 wetlands acres was offset by an average annual gain of 36,000 acres between 1997 and 2002).

104. 2004 STATUS AND TRENDS, *supra* note 103.

105. *Id.* at 76. The report describes that among the created open water ponds are freshwater fishing ponds, artificial water detention, retention and water hazard ponds, ponds for aquaculture, and ponds used solely for ornamentation, which "are not an equivalent replacement for vegetated wetlands." *Id.*

106. *Id.* at 94. The report specifically notes the ongoing net loss of freshwater emergent marshes, 142,570 acres of which were lost over this period. *Id.* at 17. The report notes the importance of these wetlands to fish and wildlife. *Id.*

107. *See* 2000 STATUS AND TRENDS, *supra* note 102. Dahl calculates the average rate of loss over the period from the mid-1950s to the mid-1970s at 458,000 acres per year. *Id.* at 34. Between 1970 and 1980, the average annual net wetland loss for the conterminous United States was 290,000 acres of wetlands each year. *Id.* Between 1986 and 1997, the net loss of wetlands in the conterminous United States appeared to slow dramatically. The total wetland loss for the decade amounted to only 644,000 acres, or an average of 58,500 acres of wetlands per year. *Id.* at 9, 34. *But see* Ralph Heimlich & Jeanne Melanson, *Wetlands Lost, Wetlands Gained*, NAT'L WETLANDS NEWSL. (Envtl. Law Inst., Wash., D.C.), May–June 1995, at 1 (providing a contrasting assessment by the Natural Resource Conservation Service for the overlapping period of 1982 through 1992 that suggested a rate of loss of 70,000 to 90,000 acres a year on non-federal lands).

country, with some states continuing to lose wetlands at an extremely rapid pace.[108] The impacts of Hurricane Katrina in August 2005 reminded the public of the ongoing losses of wetlands that are being permitted under existing law and the consequences for human health, safety, and welfare of those losses.[109]

Of course, acreage loss cannot tell the whole story,[110] but we frequently rely on acreage because we lack more detailed information about the values and functions lost.[111] Typically it is only when disaster strikes in the form of a flood or pollution of a water body that we assess with hindsight the loss of particular values and functions associated with specific wetlands.[112] In part, our failure to focus on the loss of services and values may be attributable to the fact that the loss is incremental. Each individual patch of wetlands lost to development may not cause measurable impact to the values or services we depend on, but over time, the cumulative impact of lost services and values within a watershed can be substantial.[113]

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108. *See* 2004 STATUS AND TRENDS, *supra* note 103, at 53.

109. *See* Oliver Houck, *Can We Save New Orleans?*, 19 TUL. ENVTL. L.J. 1, 56–57 (2006). Wetlands along the Louisiana coast are also being lost due to natural processes, but the impacts of permitted activities related to shipping and oil and gas development play a significant role. *Id.* Moreover, the natural processes of erosion were historically tempered by natural processes of accretion that human alteration of the Mississippi River system has now obstructed. *Id.*

110. *See* R. Eugene Turner, Ann M. Redmond & Joy B. Zedler, *Count It by Acre or Function—Mitigation Adds Up to Net Loss of Wetlands*, NAT'L WETLANDS NEWSL. (Envtl. Law Inst., Wash., D.C.), Nov.–Dec. 2001, at 14–15. In addition to the inherent limitations of acreage as a measure of lost values, assessments of the acreage lost may not be reliable. For example, they may incorporate optimistic assumptions about the long-term success of efforts to mitigate losses through creation of new wetlands. *Id.* at 14. A study by the National Research Council's Committee on Mitigating Wetland Losses found that although the Corps intends to require 178 hectares of mitigation for every 100 hectares of wetlands destroyed, a permit requiring 178 hectares of mitigation results on the ground in only 16–19 acres of restored wetland function. *Id.* at 14–15. Even the National Wetlands Inventory, which employs aerial photos to assess wetlands acreage, sometimes counts created wetlands that may not survive over time. *See* U.S. Fish & Wildlife Serv., National Wetlands Inventory, http://www.fws.gov/nwi/. For reports documenting the shortfall in efforts to create wetlands, see Ann M. Redmond, *Florida Moves to Mitigation Banking*, NAT'L WETLANDS NEWSL. (Envtl. Law Inst., Wash., D.C.) Nov.–Dec. 1995, at 14; N.J. DEP'T OF ENVTL. PROT., DIV. OF SCI., RESEARCH & TECH., CREATING INDICATORS OF WETLAND STATUS (QUANTITY AND QUALITY): FRESHWATER WETLAND MITIGATION IN NEW JERSEY (2002), http://www.state.nj.us/dep/dsr/wetlands/.

111. *See* 2004 STATUS AND TRENDS, *supra* note 103, at 89. This report expressly disclaims any effort to evaluate quality or functioning of wetlands. *Id.* However, it highlights recent state efforts in this regard, including Minnesota's ongoing commitment to monitor wetland quality and to prevent net loss of quantity, quality, and biological diversity. *Id.* at 89–91.

112. The aftermath of Hurricane Katrina provides an example of the broader public recognition that these lost values receive in hindsight. *See, e.g.*, Ecological Soc'y of Am., *Ecological Effects of Gulf Coast Hurricanes*, Aug. 7, 2006, http://www.yubanet.com/artman/publish/article_40172.shtml.

113. In Collier County Florida, the St. Petersburg Times reported that $30 million of public money was being used to buy neighborhoods that flooded because of wetlands development. *See* Craig Pittman & Matthew Waite, *They Won't Say No*, ST. PETERSBURG TIMES, May 22, 2005, at 1A, *available at* LEXIS 102BG1.

Another measure of the efficacy of the section 404 program is the rate at which permits are granted. While this is a crude and imperfect measure, the numbers in some Corps districts are startling. An investigation by the St. Petersburg Times revealed that in Florida, in 2003, out of 3,400 permit applications, 3,400 were approved and none were denied.[114] Between 1999 and 2003, 12,000 were approved and one was denied.[115]

Upon first reading these numbers, one might understandably conclude that review under section 404 had no impact on the degradation of wetlands—that no matter how extensive the activity proposed and the attendant degradation, the Corps would approve it. However, this reading of the figures on permit approvals is not a fair one. First, Florida apparently approves more permits than any other state and allows a higher percentage of filling of wetlands than the national average.[116] Second, some proposed activities undoubtedly do not cause unacceptable degradation and therefore should be permitted. Third, the very existence of section 404 may cause proponents to modify their proposals to avoid unacceptable degradation.[117] Fourth, as the Corps is quick to point out, the application process is not a one-step process. It often involves an ongoing discussion or negotiation between the applicant and the Corps during which the applicant may amend the proposal in response to Corps staff guidance on what changes are necessary to avoid unacceptable degradation.[118] In other words, a

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114. *Id.*

115. *Id.*

116. *See id.* The Corps is reported to say that nationally, 20% of wetlands are saved from destruction by Corps regulation, whereas in Florida during this period, only 6% of the acreage was preserved. *Id.* Furthermore, the Corps's national regulatory statistics for fiscal year 2002 report that of 11,437 individual applications received, 7409 were granted and 128 were denied. *See* U.S. Army Corps of Eng'rs, FY 2002 Regulatory Statistics, http://www.usace.army.mil/inet/ functions/cw/cecwo/reg/execsem02.pdf. The Corps also reports that 4143 were withdrawn, but this number includes individual applications that were withdrawn because the applicant was approved pursuant to a general permit or were treated as withdrawn because the applicant never submitted the required information. *Id.*

117. In other words, section 404 may have a deterrent effect on those who would discharge material into wetlands, leading them to propose more modest and less degrading activities than they would have in the absence of section 404. *See* Flournoy, *supra* note 25, at 645 (suggesting that the costs associated with obtaining a section 404 permit may serve as an economic deterrent to wetland destruction).

118. Thus, an applicant who submits an application for a permit may learn from Corps staff that the proposal will be denied in its present form, but might be approved if the applicant reduces the acreage to be filled, avoids certain high quality wetlands, or increases the mitigation to be provided; however, the applicant may then withdraw the proposal altogether or revise it to conform to the guidance provided by the Corps staff. *See* Michael L. Davis, *A More Effective and Flexible Section 404*, NAT'L WETLANDS NEWSL. (Envtl. Law Inst., Wash., D.C.), July–Aug. 1995, at 8; Pittman & Waite, *supra* note 113, at 1A (citing comments by John Hall, former head of Florida's Corps of Engineers permit program); *see also* 33 C.F.R. § 325.1(b) (2007) (describing pre-application consultation for major applications); U.S. Army Corps of Eng'rs, Regulatory Guidance Letters, http://www.usace.army.mil/inet/functions/cw/cecwo/reg/rglsindx.htm (letters written by the Corps to its field offices that interpret current regulations and explain how the regulations apply to permit applications); U.S. Army Corps of Eng'rs, The Permit Process: Processing Steps, https://epermit.usace.army.mil/process.html#processing (describing the pre-application consultation process).

denial may not be the only tool available to the Corps for avoiding unacceptable degradation and achieving the goals of section 404.

A problem with assessing the significance of these facts is that the Corps has not collected data that would enable one to determine how many acres are protected from degradation without a permit denial. Without such information, one is left to speculate about the impact of section 404. One plausible conclusion to draw from the extremely high rate of permit approvals is that the presence of wetlands and the existence of section 404 are rarely, if ever, an obstacle to accomplishing what a landowner wishes to do, and that if some degradation is necessary to allow the landowner to accomplish his or her purpose, that degradation will be permitted and considered acceptable degradation. Given that disposal of fill will usually degrade wetlands and interfere with important wetland values and functions to some extent,[119] this impression does not create a high degree of confidence that we are meeting the goal of avoiding unacceptable cumulative degradation. When this conclusion is paired with the long-term trend of wetlands acreage loss and replacement of vegetated wetlands by open ponds, concern for the long-term efficacy of section 404 in preserving the values and functions of wetlands seems justified. Based on this concern, we now turn to examine whether information gaps are a significant part of the problem.

III. INFORMATION DEMAND, SUPPLY, AND CONSEQUENCES UNDER SECTION 404

Part I provided an overview of section 404 and the key provisions of the EPA and Corps's regulations that govern individual permitting decisions. Part II sets forth facts suggesting cause for concern about section 404's efficacy in achieving its goals. This Part turns to examine the information flow specifically: what information demands the law creates, the supply of information generated by the law, and the consequences for permitting decisions if information demands are not met. Part III.A provides a taxonomy of demand, supply, and consequence provisions. Part III.B then provides a detailed analysis of the section 404 regulations and identifies in turn the key provisions that demand information, generate information supply, and dictate the consequences of an information shortfall. Part C steps back to identify the key features of the information scheme under section 404 based on the detailed section-by-section analysis under Part III.B.[120]

A. Demand, Supply, and Consequences

To begin, it may be useful to further define how I employ the terms demand, supply, and consequences in discussing information flow. A provision affects *demand* if it requires the agency to have information, or otherwise base its decision or action on

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119. *See* 40 C.F.R. § 230.1(d) (2007) ("The degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.").

120. Some readers may prefer to skip the painstaking and arguably tedious section-by-section analysis in Part III.B, proceed directly to Part III.C, and refer back to Part III.B for more detail on particular provisions of interest.

certain information. A provision affects *supply* if it imposes a mandate on some participant to submit, generate, or otherwise collect information for the agency's use. The ultimate regulatory effect of supply and demand provisions is determined by a third type of provision I call *consequences* provisions. These provisions either explicitly or implicitly specify the legal consequences that flow from a data gap. That is, when information supply is inadequate to support a decision under a regulatory standard or to meet a regulatory burden of proof, a consequences provision determines the regulatory consequences.

1. Demand Provisions

"Demand" provisions may take a variety of different forms. These provisions may require the agency to:

- meet a threshold or standard or make a finding as a precondition to a particular decision or action or to fulfill a direct mandate;
- articulate a basis for or create a record for a decision; or
- consider, weigh, or balance various factors, criteria, or effects before making a decision.

Some provisions that create demand are what I will call "pure" demand provisions. By that, I mean that the statute or regulation simply sets forth a demand that the agency have certain information, without specifying any direct regulatory consequences from possession of the relevant information. Requirements that the agency "make findings" on a particular topic, "determine" certain facts, or "consider" certain information are examples of such "pure" demand provisions.[121]

Other provisions creating demand may have a more direct connection to a regulatory decision. These provisions create demand and also help define what information is required to support a particular agency decision. For example, a provision may make a particular finding a prerequisite to regulatory action or otherwise assign regulatory consequences to a finding. I call such a provision a factual prerequisite, meaning that it defines findings that have regulatory significance under the statute.[122] For example, the EPA's guidelines direct that the Corps not issue a permit if it will cause or contribute to significant degradation.[123] A finding of degradation is the factual prerequisite that triggers the regulatory prohibition.

In addition, demand is sometimes created by a component of a statute that I will call the standard of care. I use the term standard of care, drawn from tort law, to refer to a regulatory standard that dictates the degree of protection or care mandated by the regulation. In other words, the standard of care determines the boundary between what

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121. *E.g.*, 40 C.F.R. § 230.11(a) (2007) (directing the Corps to determine the effects of a proposed discharge); 33 C.F.R. § 320.4(a)(1) (2007) (requiring the Corps to balance favorable impacts against detrimental impacts when regulating water activities).

122. This analysis employs some of the same terminology applied to the regulatory process in Alyson C. Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decisionmaking*, 15 HARV. ENVTL. L. REV. 327, 346–353 (1991) (discussing factual prerequisites, standards of care, and standards of proof).

123. *See* 40 C.F.R. § 230.10(c) (2007).

is acceptable and unacceptable conduct under the statute. This may clarify how much or what kind of information is demanded. For example, in the EPA's guidelines for specification of disposal sites for dredged or fill material, degradation is the factual prerequisite to regulation and the modifier "significant" embodies the standard of care.[124] The standard of care affects the demand because it provides some clarification on the question of how much and what kind of evidence of degradation is required before a permit denial is warranted.

In addition to the factual prerequisite and the standard of care, the standard of proof also affects the demand for information. The standard of proof defines how much information the agency must have in order to make a particular finding or decision. The standard of proof may be implicit rather than explicit. For example, 40 C.F.R. § 230.10(c) requires that the agency not permit a discharge if it "will cause or contribute to" significant degradation. The phrase "will cause or contribute to" determines that the agency must have a high degree of certainty that the discharge *will* cause or contribute to degradation, operating much the way a standard of proof does in common law adjudication. In contrast, regulations requiring that the agency not permit a discharge if it "*may* cause or contribute to" significant degradation would impose a lower standard of proof. The higher the standard of proof, the more certainty is demanded, which can translate into a greater quantum of information demanded.

2. Supply Provisions

Provisions that affect information supply include provisions that require a participant (including the agency) to:

- file or submit information;
- generate, create, or develop information; or
- seek or acquire information from outside sources.[125]

Some provisions are "pure" supply provisions: their sole regulatory force is to generate information. For example, a provision in the EPA's guidelines directs that the permitting authority "shall collect information and solicit information from other sources about the cumulative impacts on the aquatic ecosystem."[126] This is a pure supply provision, directing the Corps to collect and seek out information on a certain topic from outside sources, independent of other provisions that establish the regulatory significance of the information.[127] Similarly, the provision that details the

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124. *Id.*

125. I have not included in this category weaker provisions that indirectly may affect supply simply by creating an opportunity for parties to supply information on a particular topic. For example, see 33 C.F.R. § 325.2(a)(3) (2007), which requires district engineers to provide applicants the opportunity to offer views on any comments received in the public comment period if the particular engineer determines he must have them.

126. 40 C.F.R. § 230.11(g)(2) (2007).

127. *See id.* It is not a particularly clear or rigorous supply provision in that it does not specify any particular minimum information that must be collected, but it nonetheless tends to increase information supply.

required content of an application for an individual permit generates a supply of information.[128]

Beyond these pure supply provisions, the allocation of the burden of going forward and the burden of persuasion on relevant facts may also affect the supply of information. These burdens of proof are relevant to information supply because how the burden of proof is allocated affects the incentives for the provision of information.[129] A party who bears the burden of going forward or the burden of persuasion on a given question typically has an incentive to provide information on that question.[130]

3. Consequences Provisions

"Consequences" provisions address the question of the legal significance of a failure of supply to meet demand. In some cases, the consequences are explicit, and the law specifies the required outcome in the event of a data gap. These can be called "pure" consequences provisions. For example, the EPA's guidelines explicitly provide that a proposed disposal site shall be specified as failing to comply with the guidelines where "[t]here does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines."[131]

This provision explicitly dictates a regulatory outcome in the event of insufficient information. The threshold set by the consequences provision may not be a purely objective one. Here, in order to determine whether there is "sufficient information to make a reasonable judgment" on compliance with the guidelines, the agency must make both empirical and normative determinations. It must determine what information there is on compliance and whether it is "sufficient" to make a "reasonable" judgment, both highly normative determinations.

The allocation of the burden of proof may also operate as a consequences provision. The allocation of the burden of proof determines the consequences that flow from inadequate information by assigning a decisional outcome.[132] Like the allocation of the burden of proof, a presumption also determines the consequences of inadequate information, by dictating in whose favor a finding will be made in the absence of any information on a given fact.[133]

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128. *See* 33 C.F.R. § 325.1(d) (2007).

129. Wagner, *supra* note 2, at 1682.

130. The allocation of the burden of persuasion also may determine the *consequences* of an information gap, because it may determine how uncertainty will affect the outcome under the statute. *See infra* Part III.A.3.

131. 40 C.F.R. § 230.12(a)(3)(iv) (2007).

132. So, for example, the Corps's public interest regulations provide that "a permit will be granted unless the district engineer determines that it would be contrary to the public interest." 33 C.F.R. § 320.4(a)(1) (2007). Under this rule, the agency or any opponent of the discharge is implicitly allocated the burden of proving that the permit would be contrary to the public interest. In the absence of sufficient information on adverse impacts on the public interest, the permit will be granted. This results by virtue of the allocation of the burden.

133. For example, the presumption in the EPA's water quality guidelines that non-wetland alternatives exist for any proposed activity that is not water-dependent dictates that if there is insufficient evidence to clearly demonstrate the absence of other alternatives, the Corps must find that practicable alternatives to the disposal exist and hence, the discharge will not be

Related to the burden of proof is the standard of proof—the quantum of information required to support a finding. The standard of proof also helps to determine the consequences of inadequate information, by specifying how much information is necessary before the agency can or must reach a specific regulatory outcome. The standard of care selected can affect the consequences of an information shortfall as well. For example, the standard in 40 C.F.R. § 230.10(c) authorizes the Corps to deny a permit if it finds that the proposed discharge will cause "significant" degradation. It is possible that the evidence of degradation relevant to a particular application may fail to satisfy the standard of "significance" largely because of the absence of information. Thus, the standard of care may indirectly shape the consequences of an information shortage.

Employing these terms, Part III.B undertakes to review the EPA's water quality guidelines and the Corps's public interest regulations, identifying which provisions affect supply or demand or which dictate consequences of an information gap. Part III.C then analyzes whether these information-related provisions are well designed to achieve the statutory purpose of section 404.

B. A Detailed Analysis of Provisions Affecting Demand, Supply, and Consequences

1. The EPA Water Quality Guidelines

a. Demand Provisions

The EPA's water quality guidelines create extensive demands for information through a blend of pure demand provisions, factual prerequisites with regulatory significance, and standards of care. The core of the EPA's water quality guidelines—the factual prerequisites and standards of care found in 40 C.F.R. §§ 230.1, 230.10—also create the core of the guidelines' demand for information.

i. Section 230.1

Section 230.1 provides:

> Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern.[134]

The prerequisite to a determination that a permit should be granted is a finding of no unacceptable adverse impact after having considered individual and cumulative impacts.[135] Thus, regulatory action to grant or deny a permit is conditioned on a finding regarding the existence of adverse impacts. This creates a broad and general demand for information on adverse impacts, including information on cumulative impacts. The standard of care set forth in § 230.1—that permits be issued only if

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permitted. 40 C.F.R. § 230.10(a)(1)–(3) (2007).

134. 40 C.F.R. § 230.1(c) (2007).

135. *Id.*

impacts are shown not to be "unacceptable"—does not clarify the nature or extent of the demand significantly. It requires the Corps to make an almost entirely normative judgment about the evidence, rather than to define the kind or volume of information demanded.[136]

ii. Section 230.10(a)

The four core standards in § 230.10(a)-(d) also create demands for information. The first of these, § 230.10(a), provides "[e]xcept as provided under § 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."[137]

In order to fulfill its duty to evaluate permits appropriately, the Corps must have available information on practicable alternatives to the proposed discharge and the impact of these alternatives.[138] The factual prerequisite that triggers the prohibition in § 230.10(a) is a finding that a practicable alternative with less adverse impacts exists.[139] This creates a demand for information on alternatives to the proposed discharge with less adverse impacts. What alternatives will be deemed practicable is further defined in the regulations, narrowing the class of information on alternatives that must be considered.[140] The modifier "practicable" is a normative standard. The regulations define practicable as "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes,"[141] but even this guidance leaves the Corps a significant role in defining the class of alternatives that must be considered.

The scope of the required alternatives analysis has been extensively studied, and there are differing views on how extensive the demand created by this provision is. In a 1989 study of the Corps's implementation of this provision, Professor Oliver Houck

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136. The term "unacceptable adverse effects" is defined elsewhere, specifically in the context of the EPA's section 404(c) veto power. For purposes of the EPA's section 404(c) veto, "unacceptable adverse effects" is defined in the guidelines as "[i]mpact on an aquatic or wetland ecosystem which is likely to result in significant degradation of municipal water supplies (including surface or ground water) or significant loss of or damage to fisheries, shellfishing, or wildlife habitat or recreation areas." 40 C.F.R. § 231.2(e) (2007). It is not clear whether the use of the same phrase "unacceptable adverse effects" in both section 404(c) and in the presumption expressed in § 230.1 against discharges that will cause unacceptable adverse effects means that the narrow definition of unacceptable adverse effects in § 231.2(e), which mirrors section 404(c), should be applied to § 230.1. If so, the presumption would potentially only apply to those cases in which the EPA could exercise its veto power. If, however, the presumption in § 230.1 is as broad as it appears on its face and applies generally to all proposed discharges, then the narrow definition supplied in the context of section 404(c) should not apply. No other definition of "unacceptable adverse effects" appears elsewhere in the guidelines.

137. 40 C.F.R. § 230.10(a) (2007).

138. The effect of the presumptions found in 40 C.F.R. § 230.10(a)(3) is discussed further *infra* Part III.B.1(c)(ii).

139. *Id.*

140. For a delineation of these alternatives, see 40 C.F.R. § 230.10(a)(1)–(2) (2007).

141. 40 C.F.R. § 230.3(q) (2007).

documented how the Corps's practice of allowing the proponent of the activity to define the activity made the demand for evidence of practicable alternatives illusory.[142] By narrowly defining the activity, an applicant could ensure that no practicable alternative existed, and thus no information was required. In contrast, a recent article describes the least environmentally damaging practicable alternative requirement as the steepest hurdle in obtaining a section 404 permit.[143] Nonetheless, some of the examples cited in the latter article confirm that, at least in some cases, the applicant can exert dispositive influence over the definition of the project, and thus can limit the demand for information on alternatives.[144] On the other hand, Professor Houck also cites cases where the Corps or a reviewing court rejected an applicant's overly narrow project definition.[145] Thus, the reality seems to be that the demand for information on alternatives has some force and effect. However, the demand is made more elastic and less rigorous by the interpretive range accorded the term "practicable" and because, in some cases, it can be sidestepped entirely by applicants through narrow project definition. Thus, the demand that must be met to trigger the regulatory prohibition may obstruct conservation of wetlands because it hinges on information that the applicant can, by design, make impossible to obtain.

iii. Section 230.10(b)

A relatively limited demand for data is created by § 230.10(b), which requires that the Corps not grant permits if the activity would violate other specified laws. This requirement necessitates that the Corps determine compliance with state water quality standards, toxic pollution standards, and fish and wildlife protective laws. Although this standard does necessitate information, it is not the sort of information demand that seriously impedes protective regulation. The Corps requests the data on compliance from the relevant agencies enforcing these other mandates and can rely on this data and its sister agencies' evaluation of compliance under the statutes that they administer.

iv. Sections 230.10(c) & 230.11

According to § 230.10(c):

> no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by Subparts B

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142. Oliver A. Houck, *Hard Choices: The Analysis of Alternatives Under Section 404 of the Clean Water Act and Similar Environmental Laws*, 60 U. COLO. L. REV. 773, 778–79 (1989).

143. Jon Shutz, *The Steepest Hurdle in Obtaining a Clean Water Act Section 404 Permit: Complying with EPA's 404(b)(1) Guidelines' Least Environmentally Damaging Practicable Alternative Requirement*, 24 UCLA J. ENVTL. L. & POL'Y 235 (2006).

144. *Id.* at 242–46.

145. Houck, *supra* note 142, at 812–13.

> and G, after consideration of Subparts C-F, with special emphasis on the persistence and permanence of the effects outlined in those subparts.[146]

This provision's effect is to make information on whether the discharge will cause or contribute to the degradation of U.S. waters a factual prerequisite to the prohibition's operation. The threshold that triggers the regulatory prohibition is a finding that the degradation is significant. Section 230.10(c) goes on to provide an inclusive list of the types of effects that contribute to significant degradation, either individually or collectively.[147] This list is illustrative, providing more detail on the types of information that may be relevant, rather than limiting the information demanded.[148] The scope of the information demanded under § 230.10(c) is extremely broad.

The core demand created by § 230.10(c) for evidence of significant degradation is amplified through the extensive pure demand provisions in the guidelines that elaborate on the general data demands set forth in § 230.10. Among the pure demand provisions are Subpart B (40 C.F.R. § 230.11), which directs the permitting agency to make extensive factual determinations that are relevant to the ultimate determination of compliance with the guidelines, and Subpart G (40 C.F.R. §§ 230.60-.61), which sets forth testing procedures on which the factual determinations are to be based. These subparts do not have independent regulatory force, but they create a demand for specific information by detailing the types of effects the Corps must document and the testing to be performed.[149] Specifically, § 230.11 requires the Corps to "determine in writing the potential short-term or long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic ecosystem in light of Subparts C-F."[150]

Subparts C-F increase the specificity of this very broad pure demand by describing the physical, chemical, and biological characteristics of the aquatic ecosystem and the possible loss of environmental characteristics and values that can result from a

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146. 40 C.F.R. § 230.10(c) (2007).

147. *Id.* § 230.10(c)(1)–(4).

148. The list at 40 C.F.R. § 230.10(c)(1)–(4) provides:

> Under these Guidelines, effects contributing to significant degradation considered individually or collectively, include:
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> (1) Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites. [sic]
>
> (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes;
>
> (3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or
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> (4) Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.

149. 40 C.F.R. §§ 230.11, 230.60–.61 (2007).

150. *Id.* § 230.11.

discharge.[151] The nature of the findings to be made are further elaborated in § 230.11, which requires the Corps to "determine the nature and degree of effect that the proposed discharge will have, individually and cumulatively," on certain components: physical substrate; water circulation, fluctuation, and salinity; kinds and concentrations of suspended particulate/turbidity; quantity or location of contaminants; and structure and function of aquatic ecosystem and organisms.[152] Section 230.11 repeatedly identifies factors that must be "considered" or to which "consideration shall be given."[153]

v. Section 230.10(d)

Section 230.10(d) prohibits the permitting of discharges unless "appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem."[154] Rather than imposing a standard for permissible impacts, this condition assumes the acceptability of the proposed activity and then assesses whether it can be accomplished with less impact. Impact minimization is therefore the last step in the decision-making process.[155] Rather than an effects-based evaluation of the proposed activity, it operates more like a best technology standard for how to accomplish the proposed activity. Subpart H of the guidelines lists a variety of techniques that can be used to minimize the potential adverse effects of a discharge.[156] As such, these provisions can be viewed as creating an additional demand for information about relevant minimization measures that are "appropriate and practicable." However, because the regulations provide detailed examples of the appropriate technology for different types of adverse impacts, the demand for information is quite limited. Therefore, § 230.10(d) operates more as a set

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151. The characteristics of the ecosystem described in Subparts C and D are: substrate; suspended particulates/turbidity; water; current patterns and water circulation; normal water fluctuations; salinity gradients; threatened and endangered species; fish, crustaceans, mollusks, and other aquatic organisms in the food web; and other wildlife. *Id.* §§ 230.20–.32. Subpart E details the areas that qualify as special aquatic sites and the possible associated loss of values peculiar to these sites. The special aquatic sites described are: sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes. *Id.* §§ 230.40–.45. Subpart F catalogues certain human use characteristics that may be affected—municipal and private water supplies; recreational and commercial fisheries; water-related recreation; aesthetics; parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves—and the possible losses of values that discharges may cause to these human uses. *Id.* §§ 230.50–.54.

152. *Id.* § 230.11(a)–(g).

153. *See id.* § 230.11(a)–(h) (all requiring consideration of various effects or factors).

154. *Id.* § 230.10(d).

155. *Id.* § 230.5(j). The EPA-Corps interagency memorandum on sequencing conforms to this approach, requiring the Corps to consider avoidance of degradation first, then minimization, and finally, only as a third step, mitigation. Memorandum of Agreement Between The Department of the Army and the Environmental Protection Agency Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (Feb. 6, 1990), http://www.usace.army.mil/cw/cecwo/reg/mou/mitigate.htm.

156. 40 C.F.R. §§ 230.70–.77 (2007).

of technology-based requirements for permits rather than a true demand for information.

b. Supply Provisions

The EPA's guidelines contain very few information supply provisions. The major provision affecting the supply of information is the provision of the Corps's regulations that specifies the information that must be included in a permit application.[157] The Corps's regulation thus generates supply. It also limits supply by precluding the Corps from requiring the applicant to furnish additional information unless the district engineer deems it "essential" to making a determination under the guidelines.[158] Another supply provision encourages the supply of information on cumulative effects. The EPA's guidelines provide that cumulative effects "should be predicted to the extent reasonable and practical" and that "[t]he permitting authority shall collect information and solicit information from other sources about the cumulative impacts on the aquatic ecosystem."[159]

Also relevant to the supply of information is how the regulations allocate the burden of going forward and the burden of persuasion. Under the permitting scheme, by definition, the applicant bears the burden of going forward. The applicant must submit an application that contains the information specified by the Corps's regulations. This allocation of the burden to the applicant means that the party with access to the site and to relevant information about the proposed activity also has an incentive to generate adequate information to enable the Corps to make necessary determinations.[160] This is a strength of the guidelines. Another provision that affects the supply of information is found in 33 C.F.R. § 325.2(a)(1), which specifies that the Corps is required to determine the completeness of each application within fifteen days of receipt.[161] An application is deemed complete when sufficient information is received to issue a public notice.[162]

On balance, it is unclear how well-tailored these supply provisions are for supplying the volume of detailed information that is demanded under the EPA guidelines' substantive standards. The information required in the application does not include much of the information contemplated by the guidelines, but instead focuses largely on providing a description of the proposed activity—with few information demands related to the ecosystem impacts. The Corps has authority to require the applicant to submit any information that the Corps deems essential. As a result, the Corps can and does request substantial additional information in order to make the detailed assessment of potential adverse effects required under the guidelines. In light of the limited information required in the application, it seems likely that the Corps must rely on agency resources—including databases, maps, and other information—to determine

157. The information required of an applicant is set forth in the Corps's regulations at 33 C.F.R. § 325.1(d) (2007).

158. *Id.* § 325.1(e).

159. 40 C.F.R. § 230.11(g)(2) (2007).

160. *See* Wagner, *supra* note 2, at 1642.

161. 33 C.F.R. § 325.2(a)(1) (2007).

162. *Id.* § 325.1(d)(9).

what types of effects may warrant further information requests. These determinations are largely based on the location of a given project.

Two additional provisions seem to make the supply provisions of the guidelines discretionary with the Corps. 40 C.F.R. § 230.6, titled "Adaptability," makes clear that the extent of the information and analysis required for a proposal will depend on the particular nature and scale of the activity proposed:

> The manner in which these Guidelines are used depends on the physical, biological, and chemical nature of the proposed extraction site, the material to be discharged, and the candidate disposal site, including any other important components of the ecosystem being evaluated. Documentation to demonstrate knowledge about the extraction site, materials to be extracted, and the candidate disposal site is an essential component of guideline application. . . . It is unlikely that the Guidelines will apply in their entirety to any one activity, no matter how complex. It is anticipated that substantial numbers of permit applications will be for minor, routine activities that have little, if any, potential for significant degradation of the aquatic environment. It generally is not intended or expected that extensive testing, evaluation or analysis will be needed to make findings of compliance in such routine cases.[163]

This same discretion not to require the applicant to supply information is echoed in the introductory paragraph of § 230.10, which states that "[a]lthough all requirements in § 230.10 must be met, the compliance evaluation procedures will vary to reflect the seriousness of the potential for adverse impacts on the aquatic ecosystems posed by specific dredged or fill material discharge activities."[164]

These two sections appear to reflect a sensible impulse to lessen the information burden created by the substantive guidelines, and not to require extensive documentation for a case involving extremely minor impacts. The agency retains discretion to enforce the applicant's duty to supply relevant information, but these moderating provisions also make the information supply under the guidelines exceedingly uncertain and unenforceable by a third party. The adaptability regulation assumes that Corps staff will distinguish "routine" cases.[165] In seeming contrast to the restriction of discharges in § 230.1, § 230.6 assumes that "substantial numbers" of permit applications will have little, if any, potential for significant degradation, and thus the applicant's burden to supply information should be correspondingly reduced.[166]

Thus the extensive information supply created by the guidelines becomes flexible at the Corps's discretion, based on an informal determination that information is not needed. The adaptability regulation is the antithesis of a rigorous information supply provision: it grants the permit staff discretion to determine the quantity and the quality of information that is adequate for a particular proposal. This provision seems better suited to an internal agency manual—to ensure that staff avoid unnecessary documentation. But as a regulatory provision governing permit issuance, it eliminates provisions of the guidelines that would otherwise assure enforceability of or

163. 40 C.F.R. § 230.6(a) (2007).
164. *Id.* § 230.10.
165. *Id.* § 230.6(a).
166. *Id.*

accountability for the information supply. This elimination invites the Corps's staff to deviate from the guidelines at their discretion. In accordance with § 230.6, the Corps seems to be able to make information requests on an ad-hoc basis with very little guidance.[167]

c. Consequences Provisions

The ultimate impact of information demand and supply is determined by the consequences that result when information demands are not met. Several provisions in the guidelines determine the consequences of an information gap, but the picture that emerges from these provisions is murky.

i. The Conflict Among § 230.1, § 230.10, and § 230.12(a)(3)(iv)

To begin with the most explicit provision, § 230.12(a)(3)(iv) clearly sets forth the required outcome where there is not "sufficient information" to determine whether a discharge complies with the guidelines.[168] This provision directs that where "[t]here does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines," the Corps must specify that the proposed activity fails to comply with the guidelines.

Under this provision, the consequence of inadequate information is denial of a permit. Thus, the applicant's incentive to supply all necessary information is reinforced. This appears to be well designed to ensure the statutory goal of avoiding unacceptable degradation of wetlands by embodying a precautionary approach. In the absence of adequate information to determine the effects of an activity, the activity will not go forward. This also seems consistent with the presumption of § 230.1 against the permitting of discharges unless there is a finding of no unacceptable adverse effects.

In addition to this explicit consequences provision, the allocation of the burden of persuasion can determine the consequences of inadequate information. Earlier, I noted that the burden of persuasion under the guidelines' core standards in § 230.10(a)-(d) falls on the Corps if it seeks to engage the prohibitions of that section, or to any party opposing the permit. So, for example, the text of § 230.10(c) seems to prohibit issuance of a permit only when and if the Corps makes an affirmative finding that the proposed activity will cause significant degradation.[169] It is difficult to square this regulation with the clear force of § 230.1 and § 230.12(a)(3)(iv), which suggest that no discharge should be permitted in the absence of adequate information. Regardless of these sections, § 230.10(c) seems to constrain the Corps's permitting authority only upon an affirmative finding of significant adverse effects.

The tension can be seen in the following hypothetical examples. Suppose that the Corps staff were to determine that, notwithstanding information requests to the

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167. *Id.*

168. *Id.* § 230.12(a)(3)(iv).

169. *See id.* § 230.10(c). On its face 40 C.F.R. § 230.10(a) would also seem to require an affirmative finding as to the existence of practicable alternatives. However, as is described in more detail below, the burden with respect to proving the existence of a practicable alternative is shifted to the applicant in certain cases, although it may be shifted back upon a sufficient demonstration by the applicant. *See infra* Part III.B.1(c)(ii).

applicant,[170] information on the substrate of the disposal site was missing that would preclude a determination of how the discharge would affect the substrate. On these facts, § 230.12 would dictate that the discharge not be permitted. Suppose instead, however, that the applicant has supplied all specifically identified information about the substrate requested by the Corps, but because of the limits of scientific understanding about the particular type of substrate at the site, the Corps cannot affirmatively conclude that the discharge "will cause or contribute to significant degradation."[171] Should the Corps approve the permit because it lacks sufficient information under § 230.10(c) to conclude that the discharge will contribute to significant degradation? Or should the Corps deny the permit on the grounds that "[t]here does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply" with the guidelines?[172]

The answer to these questions depends in part on the definition of "information" as it is used in § 230.12. Does information mean only specifically identified data? Or does § 230.12 also dictate the regulatory outcome in the event of scientific uncertainty caused by something other than a failure of the applicant to provide requested data? The answer to these questions has potentially enormous significance for the force of section 404. If information is narrowly defined as specifically requested data, then the burden of scientific uncertainty weighs against conservation and in favor of discharges. If it is broadly defined to include any information needed to complete the relevant inquiries, then the section 404 guidelines seem to incorporate a precautionary principle: discharges are prohibited in the face of uncertainty.

The fact that these fundamental questions lurk almost unnoticed in the regulations and have apparently not been resolved through litigation may be significant. First, because the issue is not obvious, it is likely that the Corps resolves it implicitly in practice. Thus it may wield a powerful, non-obvious, and unreviewed discretion that determines the regulatory consequences of inadequate information where the inadequacy arises from scientific uncertainty. If the Corps has followed a precautionary approach, one would expect that decisions denying permits would cite scientific uncertainty on particular issues as the relevant information deficiency.[173]

Regardless of the interpretation given to § 230.12, however, the fundamental precept of § 230.1 dictates that no permit should be granted unless it can be demonstrated that the discharge "will not have an unacceptable adverse impact" either individually or cumulatively.[174] This provision seems to independently impose the burden on the applicant to prove no unacceptable adverse effect will result. It also makes denial of a permit the consequence of insufficient information, including cases where the insufficiency results from scientific uncertainty. However, § 230.1 suffers from its own interpretive issues. Specifically, the prerequisite finding that triggers the prohibition is "unacceptable" adverse impacts. The modifier "unacceptable" introduces

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170. *See generally id.* § 230.11(g)(2) (describing how the permitting authority should collect information in order to make an accurate prediction of the cumulative effects that the discharge of dredged or fill materials will have on the aquatic ecosystem).

171. *Id.* § 230.10(c).

172. *Id.* § 230.12(a)(3)(iv).

173. Although it is beyond the scope of this Article, a study of Corps permitting decisions could determine whether this in fact occurs.

174. 40 C.F.R. § 230.1(c) (2007).

a highly normative judgment that leaves the Corps with considerable discretion to determine when impacts are unacceptable.[175]

As is noted earlier, the term "unacceptable adverse impact[s]" is defined in connection with the EPA's power to veto specific disposal sites under section 404(c).[176] However, it is unclear whether this definition should be applied to its use in the seemingly broader context of § 230.1. The section 404(c) power has been used very sparingly, and the EPA has certainly not screened every proposed permit or even a large number of them under section 404(c). The prominence of the fundamental precept of § 230.1—located in the first section of the guidelines, as well as its unequivocal text—supports the conclusion that the guidelines contemplate that it will be broadly applied to screen all discharges. These facts suggest that the section 404(c) definition may not be relevant; however, it is the only definition of the term in the guidelines.[177] No matter how the definitional issue is resolved, the Corps seems to retain the latitude not to enforce the regulatory prohibition when there is an information gap by narrowly interpreting the term "unacceptable adverse impacts."[178]

ii. Section 230.10(a)

As noted above, § 230.10(a) seems to require an affirmative finding to trigger its regulatory prohibition. Thus, read in isolation, the consequence of an information gap under this subsection seems to be that a permit can be granted, and its prohibition is not engaged.[179] However, § 230.10(a)(3) contains two presumptions that partially determine the consequences in the event of an information gap. Both of these presumptions relate to discharges in locations that are deemed to be special aquatic sites. "Special aquatic sites" is a category of disposal sites that includes, among other sites, all wetlands.[180] The first presumption applies only to activities that are deemed

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175. *Id.*

176. *Id.* § 231.2(e).

177. If the definition under the EPA's veto regulations is applicable, it constrains the meaning of unacceptable adverse effects. This regulation defines an unacceptable adverse impact as an "impact on an aquatic or wetland ecosystem which is likely to result in significant degradation of municipal water supplies (including surface or ground water) or significant loss of or damage to fisheries, shellfishing, or wildlife habitat or recreation areas." 40 C.F.R. § 231.2(e) (2006). Thus impacts to municipal water supplies, fisheries, shellfishing, wildlife habitat, and recreation areas would be the only types of impacts deemed significant. Moreover, this definition simply echoes § 230.10(c) by referring to "significant degradation." *Id.* § 231.2(e); *see id.* § 230.10(c).

178. *Id.* § 230.1(c).

179. *Id.* § 230.10(a).

180. *Id.* § 230.3(q-1) (defining special aquatic sites).

> They are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.

Id. Subpart E of 40 C.F.R. § 230 identifies the following as special aquatic sites: sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes. *Id.* §§ 230.40–.45 (2007).

not to be "water dependent," and the second applies to all discharges in special aquatic sites. Section 230.10(a)(3) provides:

> Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.[181]

The first presumption takes effect if the activity is deemed not water dependent. In this instance, the Corps must presume that practicable alternatives, not in a wetland or other special aquatic site, exist. The presumption shifts the burden of persuasion to the applicant to prove that no location other than a special aquatic site exists for the activity. The main effect of this presumption, in terms of information flow, is to define the consequences of an absence of information about alternatives.

The effect of the second presumption is that any applicant proposing to discharge into a wetland for a non-water-dependent activity must clearly demonstrate that the proposed discharge will have less adverse impact on the aquatic ecosystem than would a discharge into any non-wetland site. This presumption places a burden on the applicant to clearly demonstrate that discharges into available non-wetlands sites will have greater adverse impacts on the aquatic ecosystem than a discharge into a wetland, a seemingly heavy burden. This, in part, explains the characterization of the alternatives requirement as the steepest hurdle under section 404, and complaints from regulated entities that the burden of proving the negative—that there are no practicable alternatives—is an impossible one.[182]

Thus, absent information on practicable alternatives, permits for discharges into wetlands should be denied for all non-water-dependent activities unless the applicant "clearly demonstrates" that no practicable alternatives outside a special aquatic site exist. Similarly, the Corps should deny any proposal for any discharge in a special aquatic site—including any wetland—in favor of any practicable alternative outside of a special aquatic site, unless the applicant satisfies the heavy burden of clearly demonstrating that this location will cause greater adverse impacts on the aquatic ecosystem. With these two presumptions in place, discharges into special aquatic sites should be extremely rare, and almost unheard of for non-water-dependent activities. Insufficient information to meet the burden results in denial of the permit.[183]

However, the force of both of these provisions is potentially limited by the proponent's leading role in defining the contours of the activity. This power to define the activity can include the power to define whether or not the activity is water dependent. Professor Houck's study of Corps practice under § 230.10(a) revealed instances in which the Corps's deference to the applicant's determination of whether

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181. *Id.* § 230.10(a)(3).

182. *See* Shutz, *supra* note 143, at 235–36.

183. 40 C.F.R. § 230.10(a)(3) (2007).

the project was water dependent stripped the presumptions of meaning.[184] The interpretation of § 230.10(a) documented by Houck often imposed virtually no constraint on applicants, provided they took care in defining the nature of their proposed project.[185] However, in other instances, Professor Houck points out that both the Corps (on administrative appeal) and the courts have reversed permit decisions where the Corps staff gave excessive deference to the applicant's definition of the project, thereby unduly confining the universe of alternatives.[186]

Thus, although the presumptions embedded in § 230.10(a)(3) appear facially to make an information gap on the relevant questions a mandatory ground for denial, their effect in practice may be less clear. The malleability of the standards introduced by the project definition and the determination of what is practicable weaken the force of these presumptions considerably and make the consequences of an information gap less certain.

iii. Section 230.10(c)

Like § 230.10(a), § 230.10(c) seems to require an affirmative finding to trigger its regulatory prohibition. The Corps must find that a discharge will cause or contribute to "significant degradation" to trigger a denial under this subsection. As a consequences provision, "significant degradation" contains an important and undefined normative component as its standard of care: the word "significant."[187] How much data is adequate to trigger the regulatory prohibition cannot be objectively determined because the determination depends on how much and what evidence of degradation is deemed significant.[188] Thus, in assessing whether the Corps has information adequate to meet the guidelines' demand, it must make a normative judgment as to how much and what kind of degradation qualifies as significant.

The perils of imposing this type of trans-scientific decision on agencies has been well documented.[189] Because the Corps handles thousands of individual permitting

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184. Houck, *supra* note 142, at 788. *See also* Pittman & Waite, *supra* note 113 (quoting John Hall, the former head of the Corps's Florida permit program, describing the same phenomenon based on his own experience).

185. U.S. ARMY CORPS OF ENG'RS, FINAL PERMIT, PERINI LAND & DEVELOPMENT CO. 2–3 (1988) (referring to the Squaw Creek resort, California, involving a $100 million ski resort, part of which is a $4 million golf course of which eleven acres are wetlands; finding that off-site alternatives for the golf course did not meet the applicant's purpose or need); Houck, *supra* note 142, at 785 (citing Brief for Appellant, Sylvester v. U.S. Army Corps of Eng'rs, No. 88-15376 (9th Cir. Nov. 17, 1988)) (demonstrating how, under Corps guidance, an applicant could avoid any consideration of alternatives simply by defining the project as a "four seasons destination resort" rather than as a golf course owned and operated by a ski resort).

186. *See* Houck, *supra* note 142, at 795–97, 801–02, 804–07.

187. 40 C.F.R. § 230.10(c) (2007).

188. Neither the term "degradation" nor the term "significant" is defined in the guidelines. Nonetheless, both the statute and the guidelines shed light on what constitutes degradation in the guidelines' extensive provisions describing "possible loss of values" to various ecosystems and components of the ecosystem and in the overall purposes of the CWA, respectively. *See id.* §§ 230.20–.54.

189. *See, e.g.*, Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L.Q. 1029, 1064 (1997); Wagner, *supra*

decisions, the difficulty of ensuring uniformity in interpreting this important and undefined term, and of ensuring careful and distinct handling of factual and normative questions, is compounded. This normative standard creates the opportunity to blur scientific and policy judgments, permitting the agency to disguise or ignore an information shortfall, or to fail to enforce the mandatory consequences of information that is supplied. Thus, it becomes difficult to enforce the consequences that should flow from an information shortfall, and the decision makers' accountability is reduced. Once again, the decision on what consequences will flow from an information shortfall depends in significant measure on the Corps's discretion.

2. The Corps's Public Interest Regulations

a. Demand

The Corps's regulations create a broad demand for information arising from its public interest review. However, the demand differs substantially from the provisions of the water quality guidelines because the Corps's regulations do not even purport to set a threshold or standard to govern permit issuance or denial. The regulations provide:

> The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity and its intended use on the public interest. Evaluation of the probable impact which the proposed activity may have on the public interest requires a careful weighing of all those factors which become relevant in each particular case. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. The decision whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur, are therefore determined by the outcome of the general balancing process.[190]

Thus the regulation makes issuance or denial of a permit contingent on the outcome of a balancing process. In terms of information demand, this differs critically from a provision that sets a standard of care that must be met for permit issuance. In place of a single standard, the balancing test creates two distinct categories of information: information on benefits and information on detriments. There is no absolute threshold of information that the Corps must possess on benefits or detriments to support a determination. Rather the only relevant inquiry is the *relative* strength of the information in the two categories. Thus, there is no absolute demand for information as a precursor to a regulatory decision granting or denying a permit under the public interest test.

On the one hand, because there are no absolute information demands and the Corps retains very broad discretion, the public interest review should not impede the Corps from making decisions that achieve the purposes of the statute. On the other hand, leaving the Corps with such broad discretion reduces agency accountability through judicial review. Moreover, some of the factors that the Corps includes in its public interest review are carried over from its pre-section-404 "public interest review" and

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note 2, at 1623–24.

190. 33 C.F.R. § 320.4(a)(1) (2007).

are not consistent with the mandate of section 404(b)(1).[191] For example, although the criteria Congress directed the Corps to apply in section 403(c) include economics, section 403(c) requires consideration of how degradation caused by a discharge may affect economic interests, not consideration of the economic value of the activity causing the discharge. Similarly, considerations of property ownership are not mentioned in section 403(c). Thus, the public interest review inherently tips the balance away from avoiding unacceptable adverse impacts and in favor of allowing discharges. This is done by giving weight to the economic value of the activity associated with the proposed discharge and the interests of property ownership.

Many of the remaining sections of § 320.4 are what I call pure demand provisions, which clarify to some extent what evidence may be relevant in a given case. They describe specific information that is relevant to the Corps's evaluation.[192] A few of these sections are more than pure demand provisions; they create specific standards that may partially determine whether issuance of a permit is appropriate,[193] but the majority merely elaborate what information must be "considered." Those that create something close to a threshold standard for permit issuance, and therefore an information demand, are generally phrased in very flexible and qualified terms, leaving the Corps substantial discretion to determine whether the demand has been met.[194] Moreover, all of these provisions are merely factors that feed into the overall balancing, so they can presumably be outweighed by other factors in the open-ended balancing process.

b. Supply

The basic supply provisions applicable to the public interest review are the same as those that provide information supply under the water quality guidelines. The information required for a complete permit application is set forth in 33 C.F.R. § 325.1(d). This regulation expressly places the burden on the applicant to provide all information the Corps deems essential. Under the EPA's guidelines, this creates an incentive for the applicant to provide needed information. Here, however, because the decision-making process is a balancing test, the incentives are slightly altered. As noted above, the balancing test differs because it does not create any baseline information demand that must be met before a permit can be granted. The granting of a

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191. *See* Mortimer, *supra* note 57.

192. 33 C.F.R. § 320.4(a)(2)–(3), (c)–(r) (2007).

193. *See id.* § 320.4(h) (no permit issued for activity affecting coastal zone without certification of compliance with coastal zone management program); *id.* § 320.4(i) (no permit issued without certification of compliance with Marine Protection, Research and Sanctuaries Act of 1972). Neither of these creates an independent legal duty; they incorporate preexisting legal requirements.

194. *See, e.g.*, *id.* § 320.4(l)(2) ("[D]istrict engineers . . . should avoid to the extent practicable, long and short term significant adverse impacts associated with the occupancy and modification of floodplains, as well as the direct and indirect support of floodplain development, whenever there is a practicable alternative."); *id.* § 320.4(g)(2) (explaining that applications to erect protective structures will usually receive favorable consideration); *id.* § 320.4(g)(3) (noting that proposals creating undue interference with access to, or use of, navigable waters will generally be denied).

permit is based on the *relative* strength of the evidence of benefits and detriments. Under the water quality regulations, the demand created by the thresholds for permit issuance, coupled with the consequences of inadequate information, creates the incentive for the applicant to supply the necessary information. But under the public interest balancing test, there is no comparably clear demand or similar consequences that flow from an inadequate supply. Thus, on their face, the regulations do not seem as well designed to ensure supply.

Moreover, the public interest balancing test implicitly creates two categories of information: information on benefits of the proposed activity and information on detrimental effects of the activity. The applicant has every incentive to supply information about the former, and no incentive to provide information on the latter. Thus the dynamic created is somewhat similar to that described by Professor Wagner in the realm of chemical regulation: the incentives to supply information are not well designed to achieve the protective goals of the statute.[195]

Beyond the basic supply generated by the application requirements, several specific provisions direct or authorize the Corps to collect additional information.[196] These provisions do not materially alter the relevant information supply scheme, which fails to assure that the Corps will have necessary information on the detrimental impacts of a proposed activity. The scheme relies heavily on the Corps identifying the relevant information on detrimental impacts and requesting it from the applicant.

c. Consequences

The consequences of an information shortfall are primarily determined by the structure of the public interest review as a balancing test. As noted above, this creates two categories of information, and the regulatory outcome is determined not by the absolute sufficiency of the information to meet a regulatory standard. Instead, the outcome is determined by the *relative* weight of the evidence. Because there is no absolute quantum of information required to grant or to deny a permit, there is no risk that the information will be inadequate to meet such a demand, unless the applicant fails to provide information specifically requested by the Corps.

The task of assessing the relative weight of the information on benefits and detriments under 33 C.F.R. § 320.4(a)(1) demands the exercise of considerable judgment by the Corps. The list of factors is so broad and extensive that it creates tremendous latitude for the Corps to exercise its judgment, thereby lessening the importance of the quantum of information on a given point. The regulation provides:

> That decision should reflect the national concern for both protection and utilization of important resources. All factors which may be relevant to the proposal must be considered including the cumulative effects thereof: among those are conservation, economics, aesthetics, general environmental concerns,

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195. Wagner, *supra* note 2, at 1680–82.

196. *See, e.g.*, 33 C.F.R. § 320.4(c) (2007) (stating that district engineers will consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service); *id.* § 320.4(q) (explaining that district engineers may make an independent review of the need for the project from the perspective of the overall public interest in place of the usual assumption concerning the economic benefit of the proposed activity).

> wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.[197]

The tremendously diverse nature of the factors for consideration means that the "balancing" process is of necessity an extremely imprecise exercise of discretion. Some of these values, such as conservation, aesthetics, general environmental concerns, wetlands, fish and wildlife values, land use, shore erosion and accretion, water quality, safety, considerations of property ownership and the needs and welfare of the people, may be extremely difficult to quantify. Others, such as historic properties, floodplain values, navigation, recreation, water supply and conservation, energy needs, food and fiber production, and mineral needs, may be quantifiable to some degree, although the effort to convert all of them to a single metric—such as dollars—will inevitably create uneven results. Clearly, these numerous factors can be "balanced" in only the crudest sense.

The Corps's inherent discretion in performing the balancing under § 320.4(a)(1) is reinforced by § 320.4(a)(3) which provides:

> The specific weight of each factor is determined by its importance and relevance to the particular proposal. Accordingly, how important a factor is and how much consideration it deserves will vary with each proposal. A specific factor may be given great weight on one proposal, while it may not be present or as important on another. However, full consideration and appropriate weight will be given to all comments, including those of federal, state, and local agencies, and other experts on matters within their expertise.[198]

Thus, apart from requiring the Corps to give full consideration to comments, the regulations leave the Corps to decide the appropriate weight to give to comments and to each factor. The Corps is generally required to consider all relevant factors, but this is hardly specific guidance.

Thus, the very structure of the public interest review, while making a massive amount of information potentially relevant and appropriate for consideration, does not create an information threshold. The decision to grant or to deny a permit ultimately is not affected by how much or how little information is available on any given point. The only relevant fact is the Corps's highly normative judgment as to whether the detriments of the proposed activity outweigh the benefits. The regulation specifies two different allocations of the burden of proof: one that applies generally and one that applies to wetlands deemed to perform functions important to the public interest.[199] In either case, if the benefit is great enough, the permit should be granted.

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197. *Id.* § 320.4(a)(1).

198. *Id.* § 320.4(a)(3).

199. In general a permit will be granted unless the district engineer determines that it will be contrary to the public interest. This allocates the burden to the Corps to demonstrate that the detriments outweigh the benefits if it wishes to deny a permit. *Id.* § 320.4(a)(1). In the case of discharges into wetlands deemed to perform functions important to the public interest, the burden is reversed, and no permit will be granted unless the benefits of the proposed activity

C. The Effect of Information Demand, Supply, and Consequences Provisions on Achieving the Goals of Section 404

1. The EPA Water Quality Regulations

The image that emerges from the foregoing analysis of the demand, supply, and consequences provisions of section 404 and the EPA's regulations has both strengths and weaknesses. Looking first at the strengths, in terms of information demand, the regulations set out extremely detailed information demands the substance of which seems very closely correlated to the goal of avoiding unacceptable degradation of aquatic ecosystems. The scope and content of the demands seem comprehensive and relevant. The core factual prerequisites for permit denial focus on avoiding degradation, reinforcing the demand for relevant information.

From an information supply standpoint, as well, the generally applicable regulations seem well designed to achieve the statutory goal and meet the extensive information demands. The regulations impose a duty on the applicant to provide certain information in the application, and they also provide the Corps with authority to require submission of any further information deemed essential to the permit decision. The applicant bears the burden of going forward, thus providing the applicant an incentive to supply the necessary information. These provisions create incentives for the applicant to supply relevant information, and the applicant is the party most likely to have access to necessary data and the resources to collect the information.[200] The Corps also has authority to require the applicant to provide additional essential information.

As far as the consequences of a lack of information, the presumptions embodied in § 230.1 and § 230.10(a)(3) appear on their face to be well designed to achieve the goal of avoiding unacceptable impacts by dictating that permits should be denied if there is inadequate information.[201] Moreover, the explicit rule of § 230.12(a)(3)(iv) provides that in the absence of adequate information, no permit may be granted.[202] Thus, under these provisions, it appears that the consequences of data gaps are borne by the proponent of the activity rather than by the agency, avoiding a critical flaw often found in the realm of chemical regulation.[203] Up to this point, these regulations avoid the pitfalls documented in the realm of chemical regulation. There are substantial information demands, but they are specific and appropriate to the statutory goal. The incentives created by the burdens of proof and the explicit supply provisions seem likely to generate the relevant information. And the consequences of an information shortfall appear not to undermine the statutory mission of conservation. In the absence of adequate information, no permit is to be granted, and various presumptions reinforce this same outcome. The demand provisions seem well designed on the whole, apart from some lack of clarity.

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outweigh the detrimental impacts to the wetlands. *Id.* § 320.4(b)(4).

200. *Cf.* Wagner, *supra* note 2, at 1641 (explaining that actors creating negative externalities in the areas of public health and the environment have an incentive to conceal this information).

201. *See* 40 C.F.R. §§ 230.1, 230.10(a)(3) (2007).

202. *Id.* § 230.12(a)(3)(iv).

203. *See* Flournoy, *supra* note 122, at 385–86.

Notwithstanding these basic strengths that characterize the information scheme under the EPA regulations, a more complete analysis reveals numerous provisions that tend to undermine the strengths of the provisions that affect information supply and that determine the consequences of an information shortfall. Turning to the supply provisions, although the regulations require the applicant to furnish a complete application and authorize the Corps to request further information, the regulations severely undercut this promising framework in two ways. First, the regulations make the duty to supply information "adaptable" by the Corps on a case-by-case basis. Thus the Corps's discretion—not the ample incentives to supply all relevant information otherwise afforded the applicant under the regulations—determines how much and what information is in fact supplied by the applicant in a particular case. Second, the Corps's authority to request supplemental information is limited to cases in which the information is "essential." On the one hand, allowing the Corps to demand only the information relevant and necessary to a particular case seems sensible. However, the incidental effect of both provisions is to reduce the agency's accountability for ensuring the adequacy of the information supply, and to permit, if not require, the agency to make subtle, discretionary, and generally unreviewable decisions about what information should be supplied.

Examining the consequences provisions, the most serious flaws in the information regime become apparent. There is an unresolved tension between the explicit consequences provisions of the regulations and the four core standards of the water quality regulations. The explicit consequences provisions state clearly that no permit shall be granted where information is insufficient, while the core standards of the water quality regulations authorize permit denial only if the Corps is able to make certain findings, which require a certain quantum of evidence.

In addition, undefined or poorly defined standards of care and standards of proof confer broad discretion on the Corps to determine when information shortfalls exist that will trigger consequences. The standards of care under § 230.10(c) and § 230.1 premise regulatory action on findings such as "significant" degradation and "unacceptable" adverse effects.[204] The standards of care form part of the mechanism that determines the consequences of an information shortfall. By employing undefined normative terms as the standards that distinguish permissible from impermissible conduct, the EPA has assigned the Corps an important role in determining how much and what information is needed to trigger the regulatory prohibition. In other words, the EPA has given the Corps considerable discretion to determine whether sufficient information on adverse effects exists to support a denial. Thus, there is less clarity and more discretion afforded the Corps. This raises a concern as to whether even the most conservation-minded staffer would feel exposed and vulnerable deeming degradation "significant" when (1) there is no guidance on what that term means, (2) the only party to the proceeding has a strong incentive to appeal any denial, and (3) no other party is present to argue in favor of conservation.

When one considers the considerable discretion that the regulations afford the Corps over both information supply and the consequences that flow from an information gap—in light of the Corps's history and record, and the one-party nature of most permit proceedings—this seems to be a recipe for disaster. There is long-

204. 40 C.F.R. §§ 230.10(c), 230.1 (2007).

standing criticism of Congress's decision to assign regulation of dredging and filling to an agency that is "far and away the leading dredger in the nation."[205] The conflict between the agency's historic mission promoting navigation and the conservation mission inherent in section 404 makes an information structure that is highly dependent on the Corps's exercise of normative judgment seem unwise and unlikely to assure that any particular degree of degradation will be prevented.

Moreover, recent accounts of the culture and practice within the Corps are not encouraging. Former staff from the Jacksonville District have described the section 404 program as "a huge scam" and "a make-believe program."[206] These and other comments suggest an agency that is grossly understaffed[207] and under substantial political pressure to grant permits, and to do so without delay.[208] A Corps employee from the Tampa Office explained that "[t]he regulatory program doesn't say we're out here to deny permits, . . . It says we're out here to process them."[209]

These comments suggest that the Corps's responsibility to require information from applicants and to exercise discretion to define the threshold for permit issuance may be incompatible with the policy of avoiding unacceptable degradation under section 404. The documented pressure on the Corps to speed the process and to grant permits—coming from both applicants and elected officials—coupled with the Corps's historic mission to promote navigation (specifically dredging), all create pressure on the Corps to employ the adaptability regulation to limit the applicant's duty to supply information and, in close cases, to find that impacts do not meet the standard of significance.

2. The Corps's Public Interest Regulations

The information regime created by the Corps's public interest balancing test creates a unique dynamic. As a part of the balancing test, the regulations create a demand for two distinct categories of information. Like the EPA guidelines, the applicant technically has the burden to provide all essential information. This creates an incentive for the applicant to provide information and, seemingly, to assure supply. However, this incentive is offset by the fact that the review entails merely a balancing test, not a determination of the adequacy of the information to meet some threshold standard. Thus, there are no specific consequences that flow from an absolute

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205. 2 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW: AIR AND WATER § 4.12, at 185 (2000); Blumm, *supra* note 33, at 412.

206. Pittman & Waite, *supra* note 113.

207. *See id.* (comments of Schnepel and Hall).

208. Craig Pittman & Matthew Waite, *Pressure for Permission: Vanishing Wetlands*, ST. PETERSBURG TIMES, May 23, 2005, at 1A (describing numerous cases of political pressure to approve and speed up decisions on permits); *see also* Derek Catron, *Wetlands Under Siege*, DAYTONA BEACH NEWS-J., Jan. 27, 2002, at 1A. Some accounts report that the pressure not to slow development down or anger developers has produced a regulatory culture that views the applicants as "customers" to whom the Corps sends customer satisfaction surveys. Pittman & Waite, *supra* note 113. The net result is that the mission of protecting waters from degradation for the public, which usually has no active proponent in the process, becomes secondary to the mission of processing applications for the vocal and actively-involved developers who seek permits.

209. Pittman & Waite, *supra* note 113.

information shortfall, lessening the incentive for the applicant to provide information unless the Corps specifically demands it.

Moreover, the relevant information falls into two distinct categories: benefits of the proposed discharge (which are favorable to the applicant) and costs of the discharge (which are unfavorable). Therefore, the applicant has an incentive to provide information on one category of relevant information (benefits) and a disincentive to provide information on adverse effects or costs. The combination of the lack of any clear consequences in the event of an information gap and the applicant's differential incentive to provide positive and adverse information about a project does not seem well designed to generate the information needed to ensure that unacceptable degradation does not occur.

CONCLUSION

The specific information demands created by the section 404 program appear to be appropriate. However, the provisions that should generate a supply of information leave the Corps with considerable interpretive latitude to determine how much information will be supplied. The provisions affecting information supply harness the applicant's motivation by imposing an open-ended duty on the applicant to provide all information deemed essential by the permitting agency and assigning the burden of going forward to the applicant. Thus, the scheme provides strong incentives for the applicant to generate or acquire all information demanded by the agency. However, this seemingly sound supply is undercut by the adaptability provision, which makes all but the minimal supply generated by the initial application discretionary at the behest of the permitting agency. The result is an uncertain supply, determined on an ad hoc basis by the Corps. An applicant's differential incentive to supply favorable and unfavorable information for the Corps's public interest review also seems likely to distort the information supply. Thus, the program fails to capitalize on the inherent advantage of a permitting process that places the burden of going forward on the applicant, which tends to ensure information supply.

Among the provisions that dictate the consequences of an information shortfall, the standards of care found in the core provisions of the EPA's water quality regulations and in the extremely open-ended balancing approach under the Corps's public interest review afford the Corps broad discretion to determine whether there is an information shortfall. By assigning the Corps discretion to interpret these key normative standards, the guidelines leave open the possibility that the Corps will issue permits despite evidence of degradation, which is incompatible with the purposes of the Clean Water Act, by relying on its almost unreviewable judgment that the evidence does not reach the "significance" threshold or by invoking its judgment on whether adverse effects outweigh the benefits of a proposed discharge.

Moreover, various provisions dictate inconsistent consequences in the event of an information shortfall. Some suggest that inadequate information must always lead to a permit denial, but others place a burden on the agency to make specific findings as a basis for a permit denial. This would seem to leave the Corps broad discretion to dictate outcomes simply by selecting which provision to invoke as the basis for its decision.

In sum, the potential problems created by the information regime under the section 404 permit program differ significantly from those typically found under a health-protective regulatory regime. The problem is not paralysis caused by excessive data

demands and inadequate supply. Rather, the regulatory regime grants the Corps substantial discretion to determine both what information will be supplied and what consequences will attend an information shortfall. Undefined normative standards of care, seemingly inconsistent provisions regarding the consequences of an information shortfall, and a broad grant of discretion to the Corps to determine what information should be supplied all leave much of the impact of the information regime uncertain, to be resolved on a case by case basis by the Corps. Despite several provisions that seem, on their face, to ensure a precautionary approach that will prevent issuance of a permit in the face of inadequate information, the net result is that the information regime fails to ensure that the agency will have the information it needs and that the goals of avoiding unacceptable degradation will be achieved in cases with inadequate information.