

Clean Water Act

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The **Clean Water Act** (**CWA**) is the primary federal law in the United States governing water pollution.^[1] Passed in 1972, the act established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983.

The principal body of law in effect is based on the **Federal Water Pollution Control Amendments of 1972**^[2] and was significantly expanded from the **Federal Water Pollution Control Amendments of 1948**. Major amendments were enacted in the **Clean Water Act of 1977**^[3] and the **Water Quality Act of 1987**.^[4]

The Clean Water Act does not directly address groundwater contamination. Groundwater protection provisions are included in the Safe Drinking Water Act, Resource Conservation and Recovery Act, and the Superfund act.

Clean Water Act



Full title Federal Water Pollution Control Amendments of 1972

Acronym CWA / Clean Water Act

Enacted by the 92nd United States Congress

Effective October 18, 1972

Citations

Public Law P.L. 92-500 (<http://www.glin.gov/download.action?fulltextId=68260&documentId=67980&glinID=67980>)

Stat. 86 Stat. 816 (1972)

Codification

Federal Water Pollution Control Act

Title(s) amended 33 (Navigable Waters)

U.S.C. sections created 33 U.S.C. § 1251 (<http://www.law.cornell.edu/uscode/33/1251.html>) *et seq.*

Legislative history

- **Introduced in the Senate as S. 2770 by Edmund Muskie on October 28, 1971**
- **Committee consideration by:** Senate Public Works Committee
- **Passed the Senate on November 2, 1971** ()
- **Passed the House on March 29, 1972** ()
- **Reported by the joint conference committee on October 4, 1972; agreed to by the House on October 4, 1972** () **and by the Senate on October 4, 1972** ()
- **Vetoed by President Richard Nixon on October 17, 1972**
- **Overridden by the Senate on October 18, 1972** ()
- **Overridden by the House and became law on October 18, 1972** ()

Major amendments

Clean Water Act of 1977; Water Quality Act of 1987

United States Supreme Court cases

EI duPont de Nemours & Co. v. Train, 430 U.S. 112 (<https://supreme.justia.com/us/430/112/case.html>) (1977)

EPA v. Nat'l Crushed Stone Assn., 449 U.S. 64 (<https://supreme.justia.com/us/449/64/case.html>) (1980)

V•T•E([//en.wikipedia.org/w/index.php?title=Template:Infobox_U.S._legislation&action=edit](http://en.wikipedia.org/w/index.php?title=Template:Infobox_U.S._legislation&action=edit))

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Waters protected under the CWA

All waters with a "significant nexus" to "navigable waters" are covered under the CWA; however, the phrase "significant nexus" remains open to judicial interpretation and considerable controversy. The 1972 statute frequently uses the term "navigable waters," but also defines the term as "waters of the United States, including the territorial seas."^[5] Some regulations interpreting the 1972 law have included water features such as intermittent streams, playa lakes, prairie potholes, sloughs and wetlands as "waters of the United States." In the 2006 case *Rapanos v. United States*, a plurality of the Supreme Court held that the term "waters of the United States":

...includes only those relatively permanent, standing or continuously flowing bodies of water "forming geographic features" that are described in ordinary parlance as "streams[,] ... oceans, rivers, [and] lakes."

Pollution control strategy in the CWA

Point sources

The 1972 act introduced the National Pollutant Discharge Elimination System (NPDES), which is a permit system for regulating point sources of pollution.^[6] Point sources include:

- industrial facilities (including manufacturing, mining, oil and gas extraction, and service industries)
- municipal governments and other government facilities (such as military bases), and
- some agricultural facilities, such as animal feedlots.

Point sources may not discharge pollutants to surface waters without a permit from the National Pollutant Discharge Elimination System (NPDES). This system is managed by the United States Environmental Protection Agency (EPA) in partnership with state environmental agencies. EPA has authorized 46 states to issue permits directly to the discharging facilities. The CWA also allows tribes to issue permits, but no tribes have been authorized by EPA. In the remaining states and territories, the permits are issued by an EPA regional office.^[7] (See Titles III and IV.)

In previous legislation, Congress had authorized states to develop water quality standards, which would limit discharges from facilities based on the characteristics of individual water bodies. However, these standards were only to be developed for interstate waters, and the science to support this process (i.e. data, methodology) was in the early stages of development. This system was not effective and there was no permit system in place to enforce the requirements. In the 1972 CWA Congress added the permit system and a requirement for technology-based effluent limitations.^[8]

Technology-based standards

The 1972 CWA created a new requirement for technology-based standards for point source discharges. EPA develops these standards for categories of dischargers, based on the performance of pollution control technologies without regard to the conditions of a particular receiving water body. The intent of Congress was to

create a "level playing field" by establishing a basic national discharge standard for all facilities within a category, using a "Best Available Technology." The standard becomes the minimum regulatory requirement in a permit. If the national standard is not sufficiently protective at a particular location, then water quality standards may be employed.^[9]

Water quality standards

The 1972 act authorized continued use of the water quality-based approach, but in coordination with the technology-based standards. After application of technology-based standards to a permit, if water quality is still impaired for the particular water body, then the permit agency (state or EPA) may add water quality-based limitations to that permit. The additional limitations are to be more stringent than the technology-based limitations and would require the permittee to install additional controls. Water quality standards consist of four basic elements: 1) Designated uses; 2) Water quality criteria; 3) Antidegradation policy and 4) General policies.^[10]

Designated uses

According to water quality standard regulations, states and Indian tribes are required to specify appropriate water uses. Identification of appropriate water uses takes in consideration the usage and value of public water supply, protection of fish, wildlife, recreational waters, agricultural, industrial and navigational water ways. Suitability of a water body is examined by states and tribes for usages based on physical, chemical, and biological characteristics. States and Indians tribes also examine geographical settings, scenic qualities and economic considerations to determine fitness of designated uses for a water bodies. If these standards indicate designated uses to be less than those presently attained, states or tribes are required to revise standards to reflect the uses actually being attained. For any body of water with designated uses that do not include "fishable/swimmable" target use that is identified in section 101(a)(2) of CWA, a Use Attainability Analysis must be conducted. Every three years, such bodies of water must be reexamined in order to verify if new information is available that demand a revision of the standard. If new information is available that specify "fishable/swimmable" uses can be attained, then the use must be designated.^[10]

Water quality criteria

States and tribes protect designated areas by adopting water quality criteria that allow them to adopt the criteria that EPA publishes under §304(a) of the CWA, modify the §304(a) criteria to reflect site-specific conditions or adopt criteria based on other scientifically defensible methods. Water quality criteria can be numeric criteria that toxicity causes are known for protection against pollutants. A narrative criterion is water quality criteria in which serves as basis for limiting toxicity of waste discharge to aquatic species. A biological criterion is based on aquatic community which describes the number and types of species in a water body. A nutrient criterion solely protects against nutrient over enrichment; and a sediment criterion describes conditions of contaminated and uncontaminated sediments in order to avoid undesirable effects.^[10]

Anti-degradation policy

Water quality standards consists an anti-degradation policy that requires states and tribes to establish a three-tiered anti-degradation program. Anti-degradation procedures identify steps and questions that need to be addressed when specific activities affect water quality. Tier 1 is applicable to all surface waters. It maintains and protects current uses and water quality conditions to support existing uses. Current uses is identified by showing that fishing, swimming, and other water uses have occurred and are suitable since November 28, 1975. Tier 2

maintains and protects water bodies with existing conditions that are better to support CWA 101(a)(2) "fishable/swimmable" uses. Tier 3 maintains and protects water quality in outstanding national resource waters (ONRWs), which are the highest quality waters in the US with ecological significance.^[10]

General policies

States and Indian tribes adopt general policies pertaining to water quality standards that are subject to review and approval by the EPA. These provision regarding water quality standards include mixing zones, variance, and low flow policies. Mixing zone policy is defined area surrounding a point source discharge where sewage is diluted by water. Methodology of mixing zone procedure determines the location, size, shape and quality of mixing zones. Variance policy temporarily relax water quality standard and are alternatives to removing a designated use. States and tribes may include variance as part of their water quality standard. Variance is subject to public review every three years and warrant development towards improvement of water quality. Low Flow policy pertains to states and tribes water quality standards that identify procedures applied to determining critical low flow conditions.^[10]

Nonpoint sources

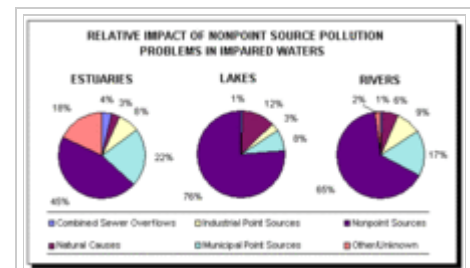
Congress exempted some water pollution sources from the point source definition in the 1972 CWA, and was unclear on the status of some other sources. These sources were therefore considered to be nonpoint sources that were not subject to the permit program.

Agricultural stormwater discharges and irrigation return flows were specifically exempted from permit requirements.^[12] Congress, however, provided support for research, technical and financial assistance programs at the U.S. Department of Agriculture to improve runoff management practices on farms. *See* Natural Resources Conservation Service.

Stormwater runoff from industrial sources, municipal storm drains, and other sources were not specifically addressed in the 1972 law. EPA declined to include urban runoff and industrial stormwater discharges in the NPDES program and consequently was sued by an environmental group. The courts ruled that stormwater discharges must be covered by the permit program.^[13]

A growing body of water research during the late 1970s and 1980s indicated that stormwater runoff was a significant cause of water quality impairment in many parts of the U.S. In the early 1980s EPA conducted the Nationwide Urban Runoff Program (NURP) to document the extent of the urban stormwater problem. The agency began to develop regulations for stormwater permit coverage, but encountered resistance from industry and municipalities, and there were additional rounds of litigation. This litigation was pending when Congress considered further amendments to the Act in 1986.

In the Water Quality Act of 1987 (1987 WQA) Congress responded to the stormwater problem by requiring that industrial stormwater dischargers and municipal separate storm sewer systems (often called "MS4") obtain NPDES permits, by specific deadlines. The permit exemption for agricultural discharges continued, but Congress created a nonpoint source pollution demonstration grant program at EPA to expand the research and development of nonpoint controls and management practices.



Nonpoint source pollutants, such as sediments, nutrients, pesticides, herbicides, fertilizers, animal wastes and other substances that enter our water supply as components of runoff and ground water, have increased in relative significance and accounts for more than 50 percent of the pollution in U.S. waters.^[11]

To combat nonpoint source pollution, EPA initiated numerous programs and grants to aid the public in improving their local water quality. These programs are described at an EPA website, Watershed Central.

Financing of pollution controls

Congress created a major public works financing program for municipal sewage treatment in the 1972 CWA. A system of grants for construction of municipal sewage treatment plants was authorized and funded in Title II. In the initial program the federal portion of each grant was up to 75 percent of a facility's capital cost, with the remainder financed by the state. In subsequent amendments Congress reduced the federal proportion of the grants and in the 1987 WQA transitioned to a revolving loan program in Title VI. Industrial and other private facilities are required to finance their own treatment improvements on the "polluter pays" principle.

Major statutory provisions

The Act has six titles.

Title I - Research and Related Programs

Title I includes a *Declaration of Goals and Policy*^[14] and various grant authorizations for research programs and pollution control programs. Some of the programs authorized by the 1972 law are ongoing (e.g. section 104 research programs, section 106 pollution control programs, section 117 Chesapeake Bay Program) while other programs no longer receive funds from Congress and have been discontinued.

Title II - Grants for Construction of Treatment Works

To assist municipalities in creating or expanding sewage treatment plants, also known as publicly owned treatment works (POTW), Title II established a system of construction grants. This was replaced by the Clean Water State Revolving Fund in the 1987 WQA. See Title VI.

Title III - Standards and enforcement

Discharge permits required

Section 301 of the Act prohibits discharges to waters of the U.S. except with a permit.^[15] (See Title IV for discussion of permit programs.)

Technology-Based Standards Program

Under the 1972 act EPA began to issue technology-based standards for municipal and industrial sources.

- Municipal sewage treatment plants (POTW) are required to meet secondary treatment standards.^[16]
- Effluent guidelines (for existing sources) and New Source Performance Standards (NSPS) are issued for categories of industrial facilities discharging directly to surface waters.^[17]
- Categorical Pretreatment Standards are issued to industrial users (also called "indirect dischargers") contributing wastes to POTW.^[18] These standards are developed in conjunction with the effluent guidelines program. As with effluent guidelines and NSPS, pretreatment standards consists of Pretreatment Standards for Existing Sources (PSES) and Pretreatment Standards for New Sources (PSNS). There are 27 categories with pretreatment standards as of 2011.

To date, the effluent guidelines and categorical pretreatment standards regulations have been published for 56 categories and apply to between 35,000 and 45,000 facilities that discharge directly to the nation's waters. These regulations are responsible for preventing the discharge of almost 700 billion pounds of pollutants each year.^[19] EPA has updated some categories since their initial promulgation and has added new categories.

The secondary treatment standards for POTWs and the effluent guidelines are implemented through NPDES permits. (See Title IV.) The categorical pretreatment standards are typically implemented by POTWs through permits that they issue to their industrial users.^[20]

Water Quality Standards Program

Water quality standards (WQS) are risk-based (also called hazard-based) requirements which set site-specific allowable pollutant levels for individual water bodies, such as rivers, lakes, streams and wetlands. States set WQS by designating uses for the water body (e.g., recreation, water supply, aquatic life, agriculture) and applying water quality criteria (numeric pollutant concentrations and narrative requirements) to protect the designated uses. An antidegradation policy is also issued by each state to maintain and protect existing uses and high quality waters.^[21]

Water bodies that do not meet applicable water quality standards with technology-based controls alone are placed on the section 303(d) list of water bodies not meeting standards. Water bodies on the 303(d) list require development of a Total Maximum Daily Load (TMDL). A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet WQS. The TMDL is determined after study of the specific properties of the water body and the pollutant sources that contribute to the non-compliant status. Generally, the TMDL determines load based on a Waste Load Allocation (WLA), Load Allocation (LA), and Margin of Safety (MOS) Once the TMDL assessment is completed and the maximum pollutant loading capacity defined, an implementation plan is developed that outlines the measures needed to reduce pollutant loading to the non-compliant water body, and bring it into compliance. Over 60,000 TMDLs are proposed or in development for U.S. waters in the next decade and a half.

Following the issuance of a TMDL for a water body, implementation of the requirements involves modification to NPDES permits for facilities discharging to the water body to meet the WLA allocated to the water body (see Title IV).

As of 2007, approximately half of the rivers, lakes, and bays under EPA oversight were not safe enough for fishing and swimming.^[22] The development of WQS and TMDL is a complex process, both scientifically and legally, and it is a resource-intensive process for state agencies.

National Water Quality Inventory

The primary mode of informing the quality of water of rivers, lakes, streams, ponds, estuaries, coastal waters and wetlands of the U.S. is through the *National Water Quality Inventory Report*. Water quality assessments are conducted pursuant to water quality standards adopted by states and other jurisdictions (territories, interstate commissions and tribes). The report is conveyed to Congress as a means to inform Congress and the public of compliance with quality standards established by states, territories and tribes.^{[23][24]} The assessments identify water quality problems within the states and jurisdictions, list the impaired and threatened water bodies, and identify non-point sources that contribute to poor water quality. Every two years states must submit reports that describe water quality conditions to EPA with a complete inquiry of social and economic costs and benefits of achieving goals of the Act. The report is organized into two major sections; Section 1 shows national assessment of each type of water body, with causes and sources identified. Section 2 summarizes recommendations on

improvement of water resource management.^[23]

Enforcement

Under section 309, EPA can issue administrative orders against violators, and seek civil or criminal penalties when necessary.^[25]

- For a first offense of criminal negligence, the minimum fine is \$2,500, with a maximum of \$25,000 fine per day of violation. A violator may also receive up to a year in jail. On a second offense, a maximum fine of \$50,000 per day may be issued.
- For a knowing endangerment violation, i.e. placing another person in imminent danger of death or serious bodily injury, a fine may be issued up to \$250,000 and/or imprisonment up to 15 years for an individual, or up to \$1,000,000 for an organization.

States that are authorized by EPA to administer the NPDES program must have authority to enforce permit requirements under their respective state laws.

Federal facilities

Military bases, national parks and other federal facilities must comply with CWA provisions.^[26]

Thermal pollution

Section 316 requires standards for thermal pollution discharges, as well as standards for cooling water intake structures.^[27] These standards are applicable to power plants and other industrial facilities.

Nonpoint Source Management Program

The 1987 amendments created the Nonpoint Source Management Program under CWA section 319.^[28] This program provides grants to states, territories and Indian tribes to support demonstration projects, technology transfer, education, training, technical assistance and related activities designed to reduce nonpoint source pollution. Grant funding for the program averaged \$210 million annually for Fiscal Years 2004 through 2008.^[29]

Title IV - Permits and licenses

State certification of compliance

States are required to certify that discharges authorized by federal permits will not violate the state's water quality standards.^[30]

NPDES permits for point sources

The NPDES permit program is authorized by CWA section 402.^[31] The initial permits issued in the 1970s and early 1980s focused on POTWs and industrial wastewater—typically "process" wastewater and cooling water where applicable, and in some cases, industrial stormwater. The 1987 WQA expanded the program to cover stormwater discharges explicitly, both from municipal separate storm sewer systems (MS4) and industrial sources.^[32] The MS4 NPDES permits require regulated municipalities to use Best Management Practices to

reduce pollutants to the "Maximum Extent Practicable."

Non-stormwater permits typically include numeric effluent limitations for specific pollutants. A numeric limitation quantifies the maximum pollutant load or concentration allowed in the discharge, e.g., 30 mg/L of biochemical oxygen demand. Exceeding a numeric limitation constitutes a violation of the permit, and the discharger is subject to fines as laid out in section 309. Facilities must periodically monitor their effluent (i.e., collect and analyze wastewater samples), and submit Discharge Monitoring Reports to the appropriate agency, to demonstrate compliance. Stormwater permits typically require facilities to prepare a Stormwater Pollution Prevention Plan and implement best management practices, but do not specify numeric effluent limits and may not include regular monitoring requirements. Some permits cover both stormwater and non-stormwater discharges. NPDES permits must be reissued every five years. Permit agencies (EPA, states, tribes) must provide notice to the public of pending permits and provide an opportunity for public comment.^[33]

As of 2001, over 400,000 facilities were subject to NPDES permit requirements.^[34] This number includes permanent facilities such as municipal (POTW, MS4) and industrial plants, and construction sites, which are temporary stormwater dischargers.^[35]

Dredge and fill exemptions

After passage of the CWA in 1972, a controversy arose as to its application to agriculture and certain other activities. The Act was interpreted by some to place restrictions on virtually all placement of dredged materials in wetlands and other waters of the United States, raising concern that the federal government was about to place all agricultural activities under the jurisdiction of the U.S. Army Corps of Engineers (USACE). For opponents of the Act, section 404 had, as a result of this concern, become a symbol of dramatic over-regulation.^{[36]:901-903} When Congress considered the 1977 CWA Amendments, a significant issue was to assure that certain agricultural activities and other selected activities, could continue without the government's supervision—in other words, completely outside the regulatory or permit jurisdiction of any federal agency.

The 1977 amendments included a set of six section 404 exemptions. For example, totally new activities such as construction of farm roads, Sec. 1344(f)(1)(E), construction of farm or stock ponds or irrigation ditches, and minor agricultural drainage, Sec. 1344(f)(1)(A), all are exempted by Statute. Section 1344(f)(1)(C), which exempts discharge of dredged material "for the purpose of. . . the maintenance of drainage ditches." All of these exemptions were envisioned to be self-executing, that is not technically requiring an administrative no-jurisdiction determination. One such example was the maintenance of agricultural drainage ditches.^{[36]:906} Throughout the hearing process, Congressmen of every environmental persuasion repeatedly stated that the over \$5 Billion invested in drainage facilities could be maintained without government regulation of any kind.^{[36]:906-912} Senator Edmund Muskie, for example, explained that exempt activities such as agricultural drainage would be entirely unregulated.^{[36]:949} Other exemptions were granted as well, including exemptions for normal farming activities.

Importance of no-jurisdiction determinations

Although Congress envisioned a set of self-executing exemptions, it has become common for landowners to seek no-jurisdiction determinations from the USACE. A landowner who intends to make substantial investments in acquisition or improvement of land might lawfully proceed with exempt activity, a permit not being required. The problem is that if the landowner's assumptions were incorrect and the activity later determined not to be exempt, the USACE will issue a cease and desist order. Obtaining an advanced ruling provides some level of comfort that the activities will have been deemed conducted in good faith.

Recapture of exemptions

Because some of the six exemptions involved new activities, such as minor drainage and silviculture (the clearing of forests by the timber industry), Congress recognized the need to impose some limitations on exemptions. Consequently, Congress placed the so-called recapture clause limitation on these new project exemptions. Under section 404(f)(2), such new projects would be deprived of their exemption if all of the following three characteristics could be shown:

1. A discharge of dredge or fill material in the navigable waters of the United States;
2. The discharge is incidental to an activity having as its purpose the bringing of an area of navigable waters into a use to which it was not previously subject, and
3. Where the flow or circulation of navigable waters may be impaired or the reach of such waters may be reduced.

To remove the exemption, all of these requirements must be fulfilled—the discharge, the project purpose of bringing an area into a use to which it was not previously subject, and the impairment or reduction of navigable waters.

Dredge and fill permits (wetlands, lakes, streams, rivers, and other waters of the U.S.)

Under sections 301 and 502 of the Clean Water Act,^[37] any discharge of dredged or fill materials into "waters of the United States," including wetlands, is forbidden unless authorized by a permit issued by the USACE pursuant to section 404.^[38] Essentially, all discharges of fill or dredged material affecting the bottom elevation of a jurisdictional water of the U.S. require a permit from USACE. These permits are an essential part of protecting wetlands, which are often filled by land developers. Wetlands are vital to the ecosystem in filtering streams and rivers and providing habitat for wildlife.^[39]

Mountaintop removal mining requires a section 404 permit when soil and rock from the mining operation is placed in streams and wetlands (commonly called a "valley fill"). Pollutant discharges from valley fills to streams also requires an NPDES permit.^[40]

There are two main types of wetlands permits: general permits and individual permits. General permits change periodically and cover broad categories of activities, and require the user to comply with all stated conditions. General permits (such as the Nationwide Permits) are issued for fill activities that will result in minimal adverse effects to the environment. Individual permits are utilized for actions that are not addressed by a general permit, or that do not meet the conditions of a General Permit. In addition, individual permits typically require more analysis than do the general permits, and usually require much more time to prepare the application and to process the permit.

When the USACE processes an application for an Individual Permit, it must publish/issue a public notice (typically in the Federal Register) describing the proposed action described in the permit application. The public notice must be issued no later than fifteen days after the Corps determines the application to be complete. Although the Corps District Engineer makes the decision to grant a permit, the EPA Administrator may veto a permit if it is not reasonable. Before making such a decision, however, EPA must consult with the USACE. A wetlands permit expires after five years.

When a state wants a permit, they make sure that all other states being affected are aware they will be sent a copy of the request and the state is able to write a recommendation. A state permit also expires after five years.

POTW Biosolids Management Program

The 1987 WQA created a program for management of biosolids (sludge) generated by POTWs.^[41] The Act instructed EPA to develop guidelines for usage and disposal of sewage sludge or biosolids. The EPA regulations: (1) Identify uses for sewage sludge, including disposal; (2) Specify factors to be taken into account in determining the measures and practices applicable to each such use or disposal (including publication of information on costs); and (3) Identify concentrations of pollutants which interfere with each such use or disposal. EPA created an Intra-Agency Sludge Task Force to aid in developing comprehensive sludge regulations that are designed to do the following: (1) Conduct a multimedia examination of sewage sludge management, focusing on sewage sludge generated by POTWs; and (2) develop a cohesive Agency policy on sewage sludge management, designed to guide the Agency in implementing sewage sludge regulatory and management programs.^[42]

The term *biosolids* is used to differentiate treated sewage sludge that can be beneficially recycled. Environmental advantages of sewage sludge consist of, application of sludge to land due to its soil condition properties and nutrient content. Advantages also extend to reduction in adverse health effects of incineration, decreased chemical fertilizer dependency, diminishing greenhouse gas emissions deriving from incineration and reduction in incineration fuel and energy costs. Beneficial reuse of sewage sludge is supported in EPA policies: the 1984 *Beneficial Reuse Policy* and the 1991 *Inter-agency Policy on Beneficial Use of Sewage Sludge*, with an objective to reduce volumes of waste generated. Sewage sludge contains nutrients such as nitrogen and phosphorus but also contains significant numbers of pathogens such as bacteria, viruses, protozoa and eggs of parasitic worms. Sludge also contains more than trace amounts of organic and inorganic chemicals. Benefits of reusing sewage sludge from use of organic and nutrient content in biosolids is valuable source in improving marginal lands and serving as supplements to fertilizers and soil conditioners. Extension of benefits of sludge on agriculture commodities include increase forest productivity, accelerated tree growth, re-vegetation of forest land previously devastated by natural disasters or construction activities. Also, sewage sludge use to aid growth of final vegetative cap for municipal solid waste landfills is enormously beneficial. Opposing benefits of sludge water result from high levels of pathogenic organisms that can possibly contaminate soil, water, crops, livestock, and fish. Pathogens, metals, organic chemical content and odors are cause of major health, environmental and aesthetic factors. Sludge treatment processes reduce the level of pathogens which becomes important when applying sludge to land as well as distributing and marketing it. Pollutants of sewage sludge come from domestic wastewater, discharge of industrial wastewater, municipal sewers and also from runoffs from parking lots, lawns and fields that were applied fertilizers, pesticides and insecticides.^[42]

The quality of sewage sludge is controlled under section 405(d), where limitations are set with methods of use or disposal for pollutants in sludge. EPA, under section 405(d)(3), established a containment approach to limit pollutants instead of numerical limitations. This methodology is more reasonable than numerical limitations and includes design standards, equipment standards, management practice, and operational standards or combination of these. Limits on sewage sludge quality allows treatment works that generate less contaminated pollutants and those that do not meet the sludge quality standards for use and disposal practice must clean up influent, improve sewage sludge treatment and/or select another use of disposal method. EPA has set standards for appropriate practices of use and disposal of biosolids in order to protect public health and the environment, but choice of use or disposal practices are reserved to local communities. Listed under section 405(e) of CWA, local communities are encouraged to use their sewage sludge for its beneficial properties instead of disposing it.^[42]

Standards are set for sewage sludge generated or treated by publicly owned and privately owned treatment works that treat domestic sewage and municipal wastewater. Materials flushed in household drains through sinks, toilets and tubs are referred to as domestic wastewater and include components of soaps, shampoos, human excrement, tissues, food particles, pesticides, hazardous waste, oil and grease. These domestic wastewaters are treated at the source in septic tanks, cesspools, portable toilets, or in publically/private owned wastewater treatment works. Alternately, municipal wastewater treatments consist of more levels of treatment

that provide greater wastewater cleanup with larger amounts of sewage sludge. Primary municipal treatment remove solids that settle at the bottom, generating more than 3,000 liters of sludge per million liters of wastewater that is treated. Primary sludge water content is easily reduced by thickening or removing water and contains up to 7% solids. Secondary municipal treatment process produces sewage sludge that is generated by biological treatment processes that include activated sludge systems, trickling filters, and other attached growth systems. Microbes are used to break down and convert organic substances in wastewater to microbial residue in biological treatment processes. This process removes up to 90% of organic matter and produces sludge that contains up to 2% solids and has increased generated volumes of sludge. Methods of use and disposal of sewage sludge include the following: Application of sludge to agricultural and non-agricultural lands; sale or give-away of sludge for use in home gardens; disposal of sludge in municipal landfills, sludge-only landfills, surface disposal sites and incineration of sludge. Managing quality of sewage sludge not only involve wastewater reduction and separation of contaminated waste from non-contaminants but also pretreatment of non-domestic wastewater. Pretreatment does not thoroughly reduce pollutants level and therefore communities have to dispose rather than use sludge.^[42]

Title V - General Provisions

Citizen suits

Any U.S. citizen may file a citizen suit against any person who has allegedly violated an effluent limitation regulation or against the EPA Administrator if the EPA Administrator failed to perform any non-discretionary act or duty required by the CWA.^[43]

Employee protection

The CWA includes an employee ("whistleblower") protection provision. Employees in the U.S. who believe they were fired or suffered adverse action related to enforcement of the CWA may file a written complaint with the Occupational Safety and Health Administration.^[44]

Title VI - State Water Pollution Control Revolving Funds

The Clean Water State Revolving Fund (CWSRF) program was authorized by the 1987 WQA.^[45] This replaced the municipal construction grants program, which was authorized in the 1972 law under Title II. In the CWSRF, federal funds are provided to the states and Puerto Rico to capitalize their respective revolving funds, which are used to provide financial assistance (loans or grants) to local governments for wastewater treatment, nonpoint source pollution control and estuary protection.

The fund provides loans to municipalities at lower-than-market rates. As of 2009 the average rate was 2.3 percent nationwide, compared to an average market rate of 5 percent. In 2009, CWSRF assistance totaling \$5.2 billion was provided to 1,971 local projects across the country.^[46]

Earlier legislation

During the 1880s and 1890s, Congress directed USACE to prevent dumping and filling in the nation's harbors, and the program was vigorously enforced.^[47] Congress first addressed water pollution issues in the Rivers and Harbors Act of 1899,^[48] giving the Corps the authority to regulate most kinds of obstructions to navigation, including hazards resulting from effluents. Portions of this law remain in effect, including Section 13, the

so-called Refuse Act. In 1910, USACE used the act to object to a proposed sewer in New York City, but a court ruled that pollution control was a matter left to the states alone. Speaking to the 1911 National Rivers and Harbors Congress, the chief of the Corps, Brigadier General William H. Bixby, suggested that modern treatment facilities and prohibitions on dumping "should either be made compulsory or at least encouraged everywhere in the United States."^[47]

Some sections of the 1899 act have been superseded by various amendments, including the 1972 CWA, while other notable legislative predecessors include:

- *Public Health Service Act of 1912*. Expanded the mission of the United States Public Health Service to study problems of sanitation, sewage and pollution.^[49]
- *Oil Pollution Act of 1924*. Prohibited the intentional discharge of fuel oil into tidal waters,^[50] authorizing USACE to apprehend violators. This was repealed by the 1972 CWA, reducing the Corps' role in pollution control to the discharge of dredged or fill material.^[47]
- The *Federal Water Pollution Control Act of 1948* created a comprehensive set of water quality programs that also provided some financing for state and local governments. Enforcement was limited to interstate waters. The Public Health Service provided financial and technical assistance.^[51]
- The *Water Quality Act of 1965* required states to issue water quality standards for interstate waters, and authorized the newly created Federal Water Pollution Control Administration to set standards where states failed to do so.^[52]

Case law

- *United States v. Riverside Bayview Homes, Inc.* (1985). The Supreme Court upheld the Act's coverage in regulating wetlands that intermingle with navigable waters.^[53] This ruling was revised by the 2006 *Rapanos* decision.
- *Edward Hanousek, Jr v. United States* (9th Cir. Court of Appeals, 1996; certiorari denied, 2000). In 1994, during rock removal operations, a backhoe operator accidentally struck a petroleum pipeline near the railroad tracks. The operator's mistake caused the pipeline to rupture and spill between 1,000 and 5,000 gallons of heating oil into the Skagway river. Despite not being present at the scene during operations White Pass and Yukon Route Roadmaster Edward Hanousek, Jr. and President Paul Taylor were both held responsible for the spill and convicted.^{[54][55]}
- *Solid Waste Agency of North Cook County (SWANCC) v. United States Army Corps of Engineers* (2001), possibly denying the CWA's hold in isolated intrastate waters and certainly denying the validity of the 1986 "Migratory Bird Rule."^[56]
- *S. D. Warren Co. v. Maine Bd. of Env. Protection* (2006). The Court ruled that section 401 state certification requirements apply to hydroelectric dams, which are federally licensed, where the dams cause a discharge into navigable waters.^[57]
- *Rapanos v. United States* (2006). The Supreme Court questioned federal jurisdiction as it attempted to define the Act's use of the terms "navigable waters" and "waters of the United States." The Court rejected the position of the USACE that its authority over water was essentially limitless. Though the case resulted in no binding case law, the Court suggested a narrowing of federal jurisdiction and implied the federal government needed a more substantial link between navigable federal waters and wetlands than it had been using, but held onto the "significant nexus" test.^[58]

Recent developments

Senator Sherrod Brown introduced S. 2094 (<http://hdl.loc.gov/loc.uscongress/legislation.112s2094>) , the "Clean

Water Affordability Act of 2012," on February 9, 2012, to update the CWA program for addressing combined sewer overflows and sanitary sewer overflows.

See also

- Great Lakes Areas of Concern
- Ocean Dumping Act
- Water supply and sanitation in the United States
- Oil Pollution Act of 1990

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External links

CWA text and analysis

- Works related to Clean Water Act at Wikisource
- Clean Water Act - Full text with amendments through 2011-01-04. (http://www.waterboards.ca.gov/laws_regulations/docs/fedwaterpollutioncontrolact.pdf) Maintained by California Water Resources Control Board.
- "Clean Water Act Jurisdictional Handbook." (http://www.elistore.org/reports_detail.asp?ID=11425) Environmental Law Institute (2nd ed., 2012)
- NYT Investigation: Corporations Violated Clean Water Act Over 500,000 Times in Last Five Years (http://www.democracynow.org/2009/9/14/nyt_investigation_exposes_severity_of_nationwide) (2009-09-14) - video report by *Democracy Now!*

EPA programs

- Clean Water State Revolving Fund (http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm)
- National Water Quality Inventory Report to Congress (<http://water.epa.gov/lawsregs/guidance/cwa/305b/>) - also called the "305(b) Report."
- Nonpoint Source Management Program (<http://epa.gov/owow/nps>)
- Total Maximum Daily Loads Program (<http://epa.gov/owow/tmdl>)

Research programs

- Center for TMDL and Watershed Studies (<http://www.tmdl.bse.vt.edu/>) Virginia Tech
- Water Environment Research Foundation (WERF) (<http://www.werf.org>)

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