CHAPTER 1
INTRODUCTION

1.1 HIGHWAY CONSTRUCTION AND STORMWATER QUALITY

The highway design and construction process requires thorough planning, thoughtful design, responsible construction practices and diligent monitoring of erosion and pollution controls to meet the water quality requirements of federal, state and local agencies.

Construction of highways typically disturbs large areas of natural vegetative cover and modifies slopes resulting in higher volumes of runoff and accelerated rates of soil erosion. Stormwater runoff from highway construction activities has been identified as a primary source of soil erosion and generation of sediment. This runoff can have significant impacts on water quality through the collection, transport and deposition of sediment, debris and chemical pollutants to storm sewer systems or waters of the United States (e.g. wetlands, dry washes, rivers, lakes, coastal waters, etc.)

Sedimentation can degrade or destroy aquatic habitat and disturb the physical stability of ephemeral channels; debris can clog receiving waters and reach oceans to impact marine wildlife habitat and chemical pollutants can harm or kill fish and other wildlife. Other environmental impacts of stormwater runoff include:

- **Turbidity** reduces in-stream photosynthesis and increases water temperatures leading to reduced food supply and aquatic habitat
- **Eutrophication** is a process whereby bodies of water receive excess nutrients that stimulate excessive plant growth and decay, reducing dissolved oxygen in the water
- **Removal of top** soil leaves hard, rocky and infertile soils that are difficult to revegetate

Construction Best Management Practices (BMPs) used to help prevent, reduce and/or mitigate the potentially harmful effects of highway pollutants in stormwater runoff are key components of the highway design and construction process. As used in this manual, BMP refers to operational activities (non-structural) or physical controls (structural) implemented to meet water quality goals.

The Arizona Department of Transportation (ADOT) has adopted this Manual to assist in developing erosion and pollution controls during the design, construction and maintenance of roadways.

1.2 PURPOSE OF MANUAL

The Manual is written to provide guidance to contractors, design professionals, field inspectors, maintenance personnel, ADOT staff and local public officials or staff.

The purpose of the Manual is to:

- Provide an overview of water quality regulations and permits.
- Outline ADOT's procedures for complying with water quality regulations and permits.
- Provide guidance for the selection of construction (temporary) BMPs on ADOT construction projects.
- Provide a "tool box" of construction BMPs.

1.3 ORGANIZATION OF THE MANUAL

The manual is organized into five chapters:

Chapter 1: Introduction includes an introduction to stormwater runoff pollutants, the purpose of the manual and an overview of water quality regulations and permits.

Chapter 2: Project Planning and Design Guide provides design guidance for incorporating stormwater quality controls into the project planning and design phases and discusses the selection of construction BMPs.

Chapter 3: Instructions for Obtaining Stormwater Discharge Permit Authorization For ADOT Construction Projects describes the steps necessary to obtain Arizona or Federal Construction General Permit authorization for ADOT projects.

Chapter 4: Stormwater Pollution Prevention Plans provides an overview of Stormwater Pollution Prevention Plan (SWPPP) preparation, a requirement for Construction General Permit (CGP) or ADOT Statewide Stormwater Discharge Permit authorization (ADOT staff only projects).

Chapter 5: Best Management Practices is a tool box of BMPs for consideration by ADOT, design professionals and the contractor during design and construction of ADOT projects.

1.4 HOW TO USE THIS MANUAL

This Manual is written to provide guidance to a wide range of users with potentially different levels of knowledge and experience.

If you are new to the subject of stormwater management, read the entire Manual to grasp the regulations, understand your role in erosion and pollution control and review the BMPs.

If you are experienced and familiar with Federal, Arizona and ADOT stormwater quality requirements and erosion and pollution control techniques, browse the table of contents, review section titles for possible new information, review the revised Construction BMPs and note the website locations for SWPPP templates and electronic Notice of Intent (NOI)/Notice of Termination (NOT) filings that will facilitate document preparation.

Remember, this Manual is a guide; always refer to the applicable regulations and permits for the exact requirements that apply to your specific project.

1.5 WATER QUALITY REGULATIONS AND PERMITS

All ADOT construction projects must comply with federal, state and local water quality regulations and permit requirements. Attention must be given to these regulations and permit requirements throughout the planning, design, construction and maintenance of a project to ensure that the quality of the waters of the United States is not compromised. Water quality regulations and permits are administered by Federal and State agencies/programs and possibly by County, City or other local agencies/programs.

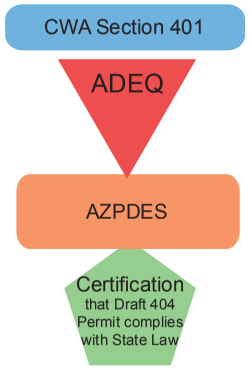
Water Quality Regulations and Permits

This chart illustrates the relationship of specific water quality regulations, the agency charged with enforcement, the program by which the regulation is managed and the permit issued to comply with the regulation. The United States Clean Water Act Section 402 permit coverage area for Arizona is listed under each permit.

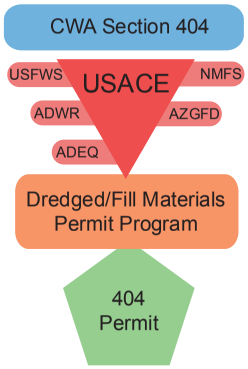
The CWA regulates all the programs shown on this chart. In some cases, state laws are also applicable. Always verify local requirements and check for updated regulations at each agency's website.

Instructions for obtaining Construction General Permit authorization are available at each agency's website and are described in the ADOT Erosion and Pollution Control Manual.

Section 402 of the Clean Water Act
Establishes the NPDES Permit Program by which authorization is granted for allowable discharges to waters of the U.S.



Section 401 of the Clean Water Act
Allows states to certify that the draft 404 permit complies with state law.



Section 404 of the Clean Water Act
Regulates discharge of dredged or fill material to waters of the U. S. and establishes a permit program to authorize approved discharges.

Legend

Abbreviations/Acronyms

ADEQ - Arizona Department of Environmental Quality
ADOT - Arizona Department of Transportation
ADWR - Arizona Department of Water Resources
ARS - Arizona Revised Statutes
AZCGP - Arizona Construction General Permit
AZGFD - Arizona Game and Fish Department
AZPDES - Arizona Pollutant Discharge Elimination System
CWA - United States Clean Water Act
EPA - Environmental Protection Agency
FCGP - Federal Construction General Permit
NMFS - National Marine Fisheries Service
NPDES - National Pollutant Discharge Elimination System
USACE - United States Army Corps of Engineers
USFWS - United States Fish and Wildlife Service

Figure 1.1: Water Quality Regulations and Permits

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Figure 1.1 illustrates water quality regulation/agency/program/permit relationships for discharge of pollutants and dredged/fill material to waters of the United States. Use this chart to assist in understanding the overview of the pertinent regulations and permitting requirements in the chapter text. Detailed information on water quality regulations and permits is found at agency websites.

United States Clean Water Act

The United States Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and for regulating quality standards for surface waters. The basis of the current CWA, the Federal Water Pollution Control Act, was enacted in 1948, and was significantly reorganized and expanded in 1972. The Environmental Protection Agency (EPA) administers the CWA.

Three sections of the CWA have significant impact on the design, construction and maintenance of Arizona's highways:

Section 401

Section 401 of the CWA enables states to provide certification that the draft 404 permit is in compliance with state law. The ADOT Environmental Planning Group (EPG) obtains 401 certification during the design process from ADEQ. Section 401 certification requirements apply to all activities regulated under Section 404 of the CWA. The Arizona Department of Environmental Quality (ADEQ) may approve or deny certification for any Section 404 Permit based on the anticipated effect on water quality. A Letter of Certification will be issued by ADEQ if the applicant is in compliance with these standards and conditions.

Section 402

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) Permit Program which issues individual permits for allowable discharges to waters of the United States and grants authorization to use the Federal Construction General Permit (FCGP) to qualified applicants. All facilities that discharge pollutants from any point source into waters of the United States are required to seek coverage under a NPDES permit. The EPA administers this Federal Program and has authorized individual states to operate the Program at the state level. In Arizona, this permit provides coverage for projects in Indian Country.

The Arizona Department of Environmental Quality (ADEQ) operates the Arizona Pollutant Discharge Elimination System (AZPDES) Permit Program and issues individual permits for allowable discharges to waters of the United States and grants authorization to use the Arizona Construction General Permit (AZCGP) to qualified applicants. In Arizona, this permit provides coverage for projects outside of Indian Country.

ADOT is authorized to discharge stormwater under the ADOT Statewide Permit for Discharge to Waters of the United States Individual Permit issued by ADEQ. This permit covers ADOT staff-only projects; operators (refer to glossary) under contract to ADOT must apply for authorization under the FCGP or the AZCGP.

Compliance with the requirements of the AZCGP constitutes compliance with the FCGP.

Chapter 3 describes the steps necessary for operators to obtain AZCGP or FCGP authorization and the steps ADOT must follow to comply with the ADOT Statewide Stormwater Discharge Permit requirements.

Section 404

Section 404 of the CWA regulates the discharge of dredged or fill material to waters of the United States and establishes a permit program. In Arizona, the U.S. Army Corps of Engineers (USACE) administers this program with advisory input from the U.S. Fish & Wildlife Service (USFWS), the National Marine Fisheries Service and Arizona resources agencies such as the ADEQ, the Game and Fish Department and the Department of Water Resources.

Essentially, any proposed work in washes, rivers, streams, lakes and wetlands requires ADOT's OES to obtain a permit from the Corps. During construction, the USACE evaluates adherence to permit conditions. Typical construction activities that are affected include the construction and maintenance of culverts, bridges, and stream bank erosion protection.

Contact the Corps for determination of permit requirements. Locate the district office nearest the project at http://www.spd.usace.army.mil/cwpm/public/ops/regulatory/index.html.

Section 402 vs. Section 404:
What's the Difference?

Section 402 provides permission to discharge treated stormwater to waters of the United States in compliance with permit limitations, conditions and use of BMPs.

Section 404 provides permission to add dredged or fill material to the waters of the United States.

Other AZPDES Permits

Other permits that fall under the AZPDES Program include:

- De Minimis General Permit (DMGP) covers small discharges resulting from specific activities, e.g., charitable car washes, aquifer testing,fire hydrants.
- Multi-Sector General Permit (MSGP) covers discharges from certain industrial sites of a non-construction nature.
- Municipal Separate Storm Sewer System (MS4) General Permit covers discharges from small or large municipal storm sewer systems.

Although these permits are not required for highway construction projects, they are relevant to a discussion of stormwater discharges.

Learn more about these permits at http://www.azdeq.gov/environ/water/permits/index.html.

Aquifer Protection Program Permit

ADEQ administers the Aquifer Protection Program and issues Aquifer Protection Permits (APP). A permit must be obtained "if you own or operate a facility that discharges a pollutant to an aquifer or the land surface or the vadose zone in such a manner that there is a reasonable probability that the pollutant will reach an aquifer." All highway construction projects with concrete washout activities must obtain an APP.

Additional Federal Land Requirements

Several agencies within the U.S. government manage public lands and may have their own erosion and pollution control requirements. These agencies include the Bureau of Indian Affairs (BIA), the Bureau of Land Management (BLM), the National Park Service (NPS), the U.S. Department of Agriculture Forest Service (USFS) and the USFWS. Each affected agency must be included in the planning and design process when roadway plans are prepared within their jurisdictions. Doing so will ensure that their requirements are incorporated into the plans.

Contact Information:

Bureau of Indian Affairs - http://www.bia.gov/

Bureau of Land Management - http://www.blm.gov/wo/st/en.html

National Park Service - http://www.nps.gov/index.htm

U.S. Department of Agriculture Forest Service - http://www.fs.fed.us/

U.S. Fish and Wildlife Service – http://www.fws.gov/

Local Government Requirements

Projects may also be located within the jurisdictions of local governments. These may include MS4s and County Flood Control Districts. Each affected agency must be included in the planning and design process when roadway plans are prepared within their jurisdictions. This will ensure that their requirements are incorporated into the plans.

> Other environmental issues such as archaeological and/or cultural sites affecting design and construction decisions may be identified during project planning and design. These issues may affect the contractor's proposed activities outside of the environmentally-cleared construction areas.

Contact Information:
Local Government Units

Phone Listings in Government Pages
Arizona Council of Governments Website:
http://www.mag.maricopa.gov/archive/AZ-COGs/index.html

Municipal Separate Storm Sewer Systems

Arizona Department of Environmental Quality Listings:
http://www.azdeq.gov/environ/water/permits/stormwater.html#ms4
EPA Region 9: Water Programs Website:
http://www.epa.gov/region09/water/npdes/index.html

County Flood Control Districts

Phone Listings County Government Pages
Arizona Association of Counties Website:
http://www.azcounties.org/

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