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Field Guide to Construction Dewatering

Course Number: CE-02-603

PDH: 3

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Module 1: Introduction

Learning Objectives

By the end of this section, you will be able to:

- **Identify** activities and water sources that constitute dewatering operations under Caltrans guidelines.
- **Evaluate** the regulatory framework, including federal and state permits, that governs construction site discharges.
- **Select** appropriate management options based on water characterization and site conditions.

Executive Summary: Construction dewatering is a highly regulated activity requiring strict adherence to federal and state water quality standards. Success depends on proactive water characterization, the implementation of a dewatering and discharge work plan, and selecting management options that minimize environmental impact while maintaining project schedules.

Overview

The **Field Guide to Construction Site Dewatering** serves as the primary resource for Resident Engineers, employees, and contractors to manage dewatering operations in compliance with water quality regulations. While it provides comprehensive guidance, it is not a substitute for professional engineering judgment or technical experience.

The guide is structured to lead users from initial definitions and regulatory identification through to specific management details and technical treatment options found in the appendices.

Dewatering Operations Defined

Dewatering operations are necessary when accumulated precipitation or non-storm water must be removed from a work location to facilitate construction. On project sites with one acre or more of land disturbance, these activities are governed by the **Construction General Permit**.

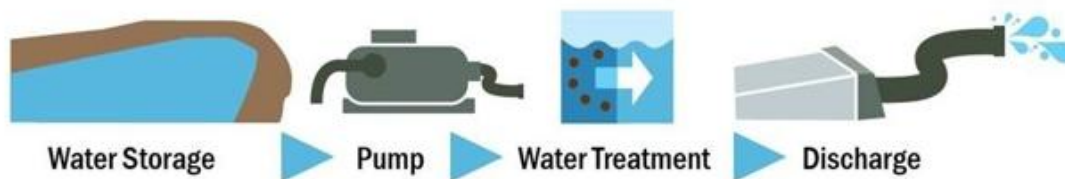


Figure 1-1. General Construction Site Dewatering Process



Common Water Sources

- **Authorized Non-Storm Water:** Includes groundwater, water from cofferdams, water diversions, and water used during construction activities.
- **Accumulated Precipitation:** Generally considered stormwater, but if commingled with construction materials or non-storm water, it is managed as non-storm water.

Activities Requiring Dewatering

Dewatering may occur during grading, trenching, channel excavation, bridge construction, and miscellaneous concrete work.

⚠ **Safety Constraint:** A dewatering and discharge work plan must be prepared and approved before any dewatering operations begin on a Caltrans construction site.

Permits and Regulations

Dewatering is governed by a hierarchy of federal and state laws.

Federal Regulations

The **Clean Water Act (CWA)** and EPA regulations require construction discharges to comply with **National Pollutant Discharge Elimination System (NPDES)** permits. In California, this authority is delegated to the **State Water Resources Control Board (SWRCB)**.

California Regulations

California regulates both surface waters and **groundwater**. Discharges to land are typically governed by **Waste Discharge Requirements (WDRs)** rather than NPDES permits. Regional Boards may also issue waivers for certain low-threat discharges.

Caltrans MS4 Permit

Construction sites with one acre or more of disturbance are not regulated by the Caltrans MS4 permit; instead, they fall under the Construction General Permit. Sites smaller than one acre must implement appropriate **Best Management Practices (BMPs)** under the MS4 permit.



Discharge of Accumulated Precipitation

Specific permits apply based on location and project size:

- **Construction General Permit:** Standard for projects \geq 1 acre.
- **Lake Tahoe CGP:** Specific to the Lake Tahoe Hydrologic Unit; prohibits discharge to waterbodies.
- **Lahontan Small Construction Permit:** For projects between 10,000 square feet and one acre in the Lahontan Region.

Non-Storm Water Dewatering Operations

The Construction General Permit authorizes uncontaminated non-storm water discharge provided it meets **Basin Plan** prohibitions and applicable **Numeric Action Levels (NALs)** or **Numeric Effluent Limitations (NELs)**.

Table 1-1. Caltrans Districts and Related Regional Board General Permits, WDRs & Waivers that Regulate Dewatering	
Caltrans District	Regional Board Dewatering General Permit, WDRs & Waivers
1	Region 1 - General Permit R1-2009-0045 Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145
2	Region 1 - General Permit R1-2009-0045 Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145 Region 6 - General Permit R6T-2008-0023 & R6T-2003-0004
3	Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145 Region 6 - General Permit R6T-2008-0023 & R6T-2011-0019
4	Region 1 - General Permit R1-2009-0045 Region 2 - No General Permit Region 3 - General Permit R3-2011-0223 Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145
5	Region 2 - No General Permit Region 3 - General Permit R3-2011-0223 Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145
6	Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145 Region 6 - General Permit R6T-2008-0023 & R6T-2003-0004
7	Region 3 - General Permit R3-2011-0223 Region 4 - General Permit R4-2013-0095 & R4-2013-0043 Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145 Region 6 - General Permit R6T-2008-0023 & R6T-2003-0004
8	Region 6 - General Permit R6T-2008-0023 & R6T-2003-0004 Region 7 - General Permit R7-2009-0300 Region 8 - General Permit R8-2009-0003 & R8-2007-0041, Resolution R8-2013-0015 Region 9 - General Permit R9-2007-0034 & R9-2008-0002, Resolution R9-2007-0104
9	Region 6 - General Permit R6T-2008-0023 & R6T-2003-0004
10	Region 2 - No General Permit Region 5 - General Permit R5-2013-0074, Resolution R5-2013-0145 Region 6 - General Permit R6T-2008-0023 & R6T-2011-0019
11	Region 7 - General Permit R7-2009-0300 Region 9 - General Permit R9-2007-0034 & R9-2008-0002, Resolution R9-2007-0104
12	Region 8 - General Permit R8-2009-0003 & R8-2007-0041, Resolution R8-2013-0015 Region 9 - General Permit R9-2007-0034 & R9-2008-0002, Resolution R9-2007-0104



Contaminated Groundwater

When contaminated groundwater is encountered, specific Regional Board permits apply for extraction and cleanup.

Table 1-2. Regional Board General Permits that Regulate Groundwater Extraction	
Caltrans District	Regional Board Groundwater Extraction General Permit
1	Region 1 – General Permit R1-2011-0028 Region 5 – General Permit R5-2013-0074
2	Region 1 – General Permit R1-2011-0028 Region 5 – General Permit R5-2013-0073 & R5-2013-0075 Region 6 – General Permit R6T-2010-0024
3	Region 5 – General Permit R5-2013-0073 & R5-2013-0075 Region 6 – General Permit R6T-2010-0024
4	Region 1 – General Permit R1-2011-0028 Region 2 – General Permit R2-2012-0012 Region 3 – General Permit R3-2011-0222 Region 5 – General Permit R5-2013-0073 & R5-2013-0075
5	Region 2 – General Permit R2-2012-0012 Region 3 – General Permit R3-2011-0222 Region 5 – General Permit R5-2013-0073 & R5-2013-0075
6	Region 5 – General Permit R5-2013-0074 Region 6 – General Permit R6T-2010-0024
7	Region 3 – General Permit R3-2011-0222 Region 4 – General Permit R4-2013-0043 ¹ Region 5 – General Permit R5-2013-0073 & R5-2013-0075 Region 6 – General Permit R6T-2010-0024
8	Region 6 – General Permit R6T-2010-0024 Region 7 – General Permit R7-2009-0400 Region 8 – General Permit R8-2012-0027 Region 9 – General Permit R9-2007-0034 ¹ & R9-2008-0002 ¹
9	Region 6 – General Permit R6T-2010-0024
10	Region 2 – General Permit R2-2012-0012 Region 5 – General Permit R5-2013-0073 & R5-2013-0075 Region 6 – General Permit R6T-2010-0024
11	Region 7 – General Permit R7-2009-0400 Region 9 – General Permit R9-2007-0034 ¹ & R9-2008-0002 ¹
12	Region 8 – General Permit R8-2012-0027 Region 9 – General Permit R9-2007-0034 ¹ & R9-2008-0002 ¹

¹ This permit also regulates various categories of discharges including construction dewatering



Utility Vault Dewatering

Utility companies dewatering vaults for maintenance may operate on Caltrans sites. While Caltrans operations typically do not require this specific permit, the Utility Vault General Permit remains in effect even past its expiration date.

Dewatering Operations Requiring an NPDES Permit

An NPDES permit is necessary for discharges to **waterbodies, storm drains, or MS4s**.

💡 Design Tip: To save time and cost, prioritize management options that do not require an NPDES permit, such as discharge to a sanitary sewer, on-site reuse, or discharge to adjacent land. These options typically require a written agreement or pre-treatment rather than extensive NPDES reporting.

Why are Dewatering Operations Regulated?

Regulation prevents construction pollutants from causing the receiving water to exceed quality standards.

What are Considered Pollutants?

Pollutants are grouped based on visibility and regulatory monitoring requirements:

- **Sediment:** Monitored via turbidity and total suspended solids; usually requires treatment before discharge.
- **pH:** Monitored primarily near concrete and grouting operations; regulated between 6.5 and 8.5.
- **Other Pollutants:** Includes nutrients, metals, pesticides, and fuels. These may be non-visible and require certified laboratory testing.

Options for Managing Dewatering Operations

Select an option based on water volume and quality:

1. **On-Site Management:** Retain within site limits (e.g., evaporation/infiltration).
2. **Adjacent Land Discharge:** Requires owner agreement.
3. **Facility Reuse:** Industrial or non-potable use at a nearby facility.
4. **Sanitary Sewer:** Requires a permit from the local sewerage agency.
5. **Off-Site Treatment:** Hauling for disposal at a licensed facility.
6. **Storm Drainage Discharge:** Governed by the Construction General Permit or site-specific NPDES permit.



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