هـيـئـة الـبـيـئـة - أبـوظـبـي
Environment Agency - ABU DHABI

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

EAD-EQ-PCE-TG-15

| | | |
|---|---|---|
| Environmental Quality Sector | *Corporate Management Representative | Secretary General |
| Originated By | Reviewed By | Approved By |

* Refer to SG Circular S.G/C-08/12 Concerning Appointment and Responsibilities of the Corporate Management Representative at the Environment Agency – Abu Dhabi.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Table of Contents

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Definitions of Terms

**Construction Environmental Management Plan**—A site-specific plan developed to ensure that appropriate environmental management practices are followed during the construction phase of a project.

**Dewatering**—The temporary removal of ground water or surface water from a construction site to allow construction to be under dry conditions.

**Discharge**—Any release of a pollutant into the environment, whether it is gaseous, liquid, or solid in nature, or a combination thereof.

**Erosion**—The wearing away of the land surface by wind or water. Erosion is intensified by land-clearing practices related to construction.

**Hazardous Waste**—Waste containing properties that are potentially harmful to human health and the environment, such as toxic, explosive, flammable, or radioactive substances.

**Material Safety Data Sheet**—A sheet that contains vital information about the properties of a particular substance. This sheet is intended to provide employees and emergency personnel with the appropriate procedures for handling or working with that substance in a safe manner. A Materials Safety Data Sheet also includes information such as physical data, toxicity, health effects, reactivity, storage, disposal, personal protective equipment, and first aid and spill-handling procedures.

**Pollutant**—Generally, any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems.

**Sanitary and Septic Waste**—The refuse liquids and excrement produced during construction.

**Sedimentation**—The deposition or accumulation of sediment.

**Solid Waste**—Rubbish, debris, garbage, and other discarded solid materials resulting from a construction project.

**Wastewater**—The spent or used water from construction activity that contains dissolved or suspended matter.

## List of Abbreviations

| | |
|---|---|
| AD EHS Center | Abu Dhabi Environment, Health, and Safety Center |
| CEMP | Construction Environmental Management Plan |
| CEHSP | Construction Environment, Health and Safety Plan |
| DMP | Discharge Management Plan |
| EAD | Environment Agency–Abu Dhabi |
| EAP | Environmental Action Plan |
| EHS | Environment, Health, and Safety |
| EHSMS | Environment, Health and Safety Management System |
| EIA | Environment Impact Assessment |
| EMP | Environmental Management Plan |
| EMS | Environmental Management System |
| EPA | Environmental Permit Application |
| MSDS | Material Safety Data Sheet |
| NOC | No Objection Certificate |

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

| | |
|---|---|
| ODS | Ozone-Depleting Substance |
| PCB | Polychlorinated Biphenyls |
| PER | Preliminary Environmental Review |
| SRA | Sector Regulatory Authority |

## Purpose of This Guidance Document

The Environment Agency−Abu Dhabi (EAD) requires proponents and contractors to prepare and implement a Construction Environmental Management Plan (CEMP) to ensure that construction development considers aspects of environmental protection and pollution control. Development and implementation of the CEMP is in accordance with the requirements outlined in Federal Law No. 24 of 1999 for the Protection and Development of the Environment and the Abu Dhabi Emirate Environment, Health, and Safety Management System Regulatory Framework (Decree 42 of 2009). As a part of the CEMP procedures for managing and mitigating risk for constructions projects, the proponent must prepare and implement control plans that thoroughly address site-specific mitigation measures for all environmental impacts. As detailed in the current EAD *Technical Guidance Document for CEMP* (EAD, 2010), mitigation strategies should be based on the best available management practices and technologies that will eliminate or minimize adverse impacts to health, safety, amenity, traffic, or the environment in the surrounding area. In support of that objective, this document is intended to provide proponents and contractors with information about the best management practices (BMPs) that can be used to prevent polluted discharges into the storm drainage system and/or surrounding environment during construction operations.

This Technical Guidance Document is written in a general format; therefore, it can be used at most construction sites in Abu Dhabi Emirate. This document assumes that proponents and contractors will obtain discharge authorization under an appropriate general permit for development projects. This document also assumes that they will use the permit and this guidance document to maintain proper water pollution control BMPs throughout construction. This document is not intended to serve as an engineering or design manual about BMPs. The engineer or other qualified person should use the appropriate BMP specifications when developing the details of a CEMP.

Construction discharge BMPs in this Technical Guidance Document are practices that have been approved by EAD for implementation in Abu Dhabi Emirate. Implementation depends on the conditions and applicability of deployment described as part of the BMP. BMPs included in this document shall be implemented on all construction projects in Abu Dhabi Emirate, where applicable. Discharge pollution control measures are intended to be implemented in a proactive manner during all seasons while construction is ongoing.

Section I of this Technical Guidance Document provides background information about discharges as related to construction operations. Section II describes the BMPs that are typically implemented during construction projects. Section III describes BMP inspection, maintenance, and recordkeeping requirements.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Section I. Background Information

Construction projects generate large amounts of waste and wastewater that can pollute waterways (e.g., marine water, lagoons), soil and groundwater, and stormwater runoff. Many different practices can be used to reduce the potential for construction activities and storm events to discharge pollutants into storm drains and surface waters. These practices include dewatering, waste and wastewater management, material handling and storage, and spill prevention and control measures. In addition, soil exposed by construction activities in Abu Dhabi is especially vulnerable to wind erosion. If dust and sediment controls and good housekeeping practices are not followed, then construction activities can discharge significant amounts of sediment and other pollutants into the marine environment.

## Construction Discharges

Some discharges from construction activities may be allowed under the terms and conditions of development project permits; however, proponents and contractors should make every effort to eliminate these discharges where possible. Proponents and contractors should identify these sources in their CEMPs and other related environmental plans. They should also identify pollution prevention measures to ensure that pollutants are not introduced to these discharges, and then carried to the surrounding environment. Discharges from construction activities may include discharges from dewatering at the site; waters used to wash vehicles, equipment, and pavements; concrete washout; and stormwater runoff.

Typical contaminants associated with the construction discharges can include the following:

- Sediment
- Concrete and asphalt
- Trash or construction debris
- Fuels and solvents
- Corrosives
- Cleaning agents
- Chlorine
- Heavy metals
- Acids
- Microbiological contaminants.

The suite of BMPs described in this Technical Guidance Document includes pollution prevention practices that are designed to prevent the contamination of construction discharges from a wide range of materials and wastes at a site. Sections II and III of this document discuss many key principles designed to help proponents and contractors identify the pollution prevention practices that should be described in their CEMPs, other related environmental plans, and reports. These key principles, which should be implemented at the sites, are as follows:

- Control dewatering practices
- Designate concrete washout areas
- Control vehicle and equipment cleaning
- Control fueling and maintenance practices
- Develop a Spill Prevention and Response Plan
- Establish proper building material staging areas
- Provide for proper waste management
- Control dust and protect storm drain inlets
- Inspect and maintain controls.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Section II. Construction Discharge BMPs

This section lists the BMPs that should be considered during construction operations. These BMPs are consistent with the control practices required under EAD's General Permit for development projects. BMPs for discharges from construction activities are divided into five categories: dewatering, wastewater management, spill prevention and response, waste management and materials pollution control, and dust and sediment control.

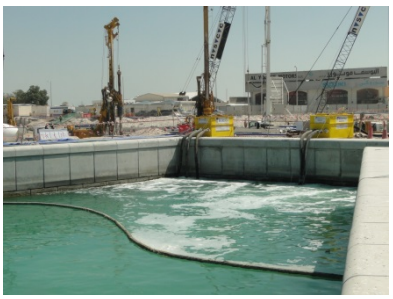
The suite of BMPs included in a CEMP should reflect the specific conditions at the site. The information collected during the Environmental Impact Assessment should help proponents and contractors select the appropriate BMPs for their sites. An effective CEMP includes a combination or suite of BMPs that are designed to work together.

## Category 1: Dewatering

Dewatering is the temporary removal of ground or surface water from a construction site to allow construction to be performed under dry conditions. Dewatering of excavations for foundations, cofferdams, and trenches is a common practice during the construction of buildings, bridges, culverts, and public utilities. It is important to note that the controls discussed in this section address sediment only. Discharge of contaminated groundwater is strictly prohibited. If the presence of contaminated groundwater is suspected or identified, either through visual observation or testing, then the proponent and/or contractor should stop work and notify EAD immediately.

**A typical wellpoint dewatering system.**

**Settling tanks discharging into the sea.**



**Silt curtain at dewatering discharge point.**

### Control Measures

The following control measures for dewatering operations can be implemented at a construction site:

- Develop a comprehensive Dewatering Plan as part of the CEMP that details the location of dewatering activities, equipment, discharge point(s), emergency response measures, and the proposed monitoring and reporting requirements.
- Filter sediment-laden water through an approved sediment-trapping device prior to discharge from the site. Dewatering effluent should be discharged in a manner that does not adversely affect marine water or off-site property.
- Inspect the dewatering site regularly to ensure that the discharge is adequately controlled.
- Use a variety of methods to treat water during dewatering operations at the construction site. The particle sizes of the sediment and the permit or receiving water limitations for sediment are key considerations for selecting sediment treatment option(s); in some cases, it may be appropriate to use multiple devices. The following devices provide options to achieve sediment removal:
  - Wellpoint system—This system consists of a number of wellpoints spaced along a trench or around an excavation site, all connected to a common header, which is attached to one or more wellpoint pumps. For construction projects, the requirements vary drastically from one project to another, so wellpoint systems should be designed by professional engineers and installed by specialized contractors to ensure proper function.
    - Design settling tanks to treat the expected flow rate of dewatering discharge.
    - Comply with the manufacturers' specifications, in terms of piping arrangement and flow rate, for the settling tanks.
    - Place in-flow pipes in the designated location.

- Clean the accumulated sediments out of the settling tanks.
- Use silt curtains at the discharge point in the sea to control pollutant discharges.
- Use gravel in the dewatering wells to filter pumped discharges.
- Control the dewatering path to avoid other wastewater discharges into the dewatering system.

– Dewatering tank—This tank removes debris and sediment. Tanks are delivered to the site by the vendor, which can provide assistance with set-up and operation. The tank size will depend on flow volume, constituents of concern, and residency period required. Vendors must be consulted to determine the appropriate size of the tank. To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pretreatment for other methods.

– Sediment/desilting basin—This is a temporary basin with a controlled-release structure that is formed by excavation or construction of an embankment to detain sediment-laden runoff and allow the sediment to settle out before discharging. Sediment/desilting basins should be designed by professional engineers and constructed according to the design standards specified in project drawings.

# Category 2: Wastewater Management

## Concrete Wash Water

Concrete wash water is the wastewater generated from washing out ready-mix trucks, pumps, drums, and chutes during concrete pours. Although concrete wash water is void of concrete sediment, this water typically has a high pH level and contains heavy metals, which are highly toxic to fish and aquatic life. Concrete wash water can also percolate down through the soil and alter the soil chemistry, inhibit plant growth, and contaminate the groundwater. Therefore, personnel should never dispose of washout water in the street, storm drains, drainage ditches, and waterways or by infiltration into the ground.

### *Types of Concrete Washout Areas*

Different types of washout containers are available for collecting, retaining, and recycling the wash water and solids from washing down mixed-truck chutes and pump truck hoppers at construction sites.

#### *Prefabricated Washout Containers*

Although not recommended for sites generating high volumes of concrete washout, prefabricated concrete washout containers can be ordered or purchased and delivered to the site. Some companies even offer prefabricated washout containers with ramps to accommodate concrete pump trucks. Some companies also offer full-service option that includes delivery of containers and regular pickups of solid and liquid waste materials, which relieve the Site Superintendent of having to dispose of the materials. Also, the prefabricated containers resist damage and protect against spills and leaks so less maintenance is required.

**Prefabricated washout container with ramp.**

#### *Self-constructed Concrete Washouts*

Self-constructed washouts are suitable for sites that generate high volumes of concrete washout, but are much less reliable than prefabricated containers and are prone to leaks. Self-constructed concrete washouts can be constructed above-grade or below-grade depending on the site conditions. Whether above-grade or below-grade, concrete washouts must be carefully sized, lined with thick plastic, inspected, and maintained to prevent leaks and spills.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

### *Control Measures*

There are two BMP objectives for concrete washout. The first objective is to collect and retain all of the concrete washout water and solids in leak-proof containers, so that the caustic material does not reach the soil surface, and then migrate to surface waters or into the groundwater. The second objective is to recycle 100% of the collected concrete washout water and solids. The following control measures for concrete wash water can be implemented at a construction site:

- Minimize on-site washing activities and subsequent concrete waste production as far as reasonably practicable. If possible, all concrete waste and wash water should be returned with each concrete truck for disposal at the concrete batch plant. If this is not possible, then operators can install an on-site concrete washout area.
- Place washout structures in locations that provide convenient access to concrete trucks, preferably near the area where concrete is being poured. However, these structures should not be placed within 50 feet of storm drains, drainage ditches, or waterbodies.
- Erect signs that clearly identify each washout location. Further signage may be necessary to direct concrete trucks to the designated area.
- Design washout facilities in sufficient size to contain all liquid and solid concrete wastes generated by washout operations. The design criteria must consider the maximum concrete work operation, and a minimum freeboard of 40 centimeters for the washout facility must be maintained at all times.
- Ensure that ready-mixed truck drivers are aware of washout facility locations and be watchful for improper dumping of cementitious material. In addition, concrete washout requirements should be included in contracts with concrete delivery companies.
- Limit concrete washing to external chute of the ready-mix vehicles.
- Recycle and reuse wash water rather than allowing it to evaporate. Wash water from concrete truck chutes, hand mixers, or other equipment can be passed through a system of weirs or filters to remove solids. Then, the wash water can be reused to wash down more chutes and equipment at the construction site or as an ingredient for making additional concrete. When the wash water in a concrete washout container at a construction site has been removed or allowed to evaporate, the hardened concrete that remains can be crushed and reused as a construction material.

## Vehicle and Equipment Cleaning

Wash water used to clean vehicles and equipment should not be discharged from the construction site because this water contains pollutants. All vehicles should be washed and cleaned offsite when possible.

### *Control Measures*

If it is necessary to clean vehicles or equipment onsite, then the following control measures should be implemented:

- When cleaning of a vehicle or equipment must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, then the outside cleaning area should be
  - Located away from storm drain inlets, drainage facilities, or waterways.
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runon and runoff.
  - Configured with a sump and storage tank to allow collection and disposal of wash water. Wash waters should be contained and hauled offsite to an approved disposal location and never discharged to storm drains or waterways.
  - Used only when absolutely necessary.
- Prohibit the use of soap and solvents to clean vehicles and equipment.
- Regularly inspect the sump and remove liquids and sediment as necessary.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Category 3: Spill Prevention and Response

### Vehicle and Equipment Fueling and Maintenance

Spills most commonly occur during fueling and maintenance operations at a construction site. In view of that, fueling and maintenance work performed on vehicles and equipment onsite should be closely monitored and controlled.

#### *Control Measures*

The following control measures for fueling and maintenance of vehicles and equipment can be implemented at a construction site:

- Ensure that all fueling operations are never left unattended. Equipment-fueling operations should only be performed by employees who have been trained in proper discharge prevention procedures. When fueling a tank, a competent person should be assigned to assist the fuel supplier. Equipment or fuel tanks should never be "topped off." Personnel should know where the supply source for the fuel is located and how to shut it off in case there is an accidental spill. In addition, fuel-dispensing nozzles should be stored in a manner that controls drips.
- Equip fueling nozzles with automatic shut-offs valves. Vapor recovery nozzles should be used where required.
- Prevent spilled fuel from entering the storm drain system, natural waterways, or ditches. Designated fueling areas should be on a level surface and at a minimum of 50 feet away from any storm drain inlets, natural waterways, or ditches. The area should be enclosed by a berm or a dike that completely prohibits the escape of pollutants in case a spill should occur.
- Provide absorbent spill cleanup materials in fueling areas that can be used on all spills, including small ones, and disposed of properly. If vehicles or equipment should be fueled in an area outside of the designated area, a drip pan or absorbent pad should be used under the vehicle.
- Establish designated maintenance areas at a minimum of 50 feet downstream from any storm drain inlets, natural waterways, ditches, or drainage channels. For long-duration projects, it is recommended that a tent be erected over the maintenance area.
- Use drip pans or absorbent pads to collect spills and leaks during maintenance activities. All spills should be immediately cleaned up, and absorbent materials should be kept in the maintenance area. All used absorbent materials should be disposed of properly.
- Promptly transfer used fluids (e.g., oil, antifreeze, lubricants) to the proper waste or recycling drums. Full drips pans or other open containers should not be left lying around. All used fluids should be disposed of through a service provider approved by the Center of Waste Management–Abu Dhabi.

### Spill Prevention and Response Plan

As part of a CEMP, a site-specific Spill Prevention and Response Plan should be developed for every site. At a minimum, the Spill Prevention and Response Plan should include the following:

- Descriptions of the physical layout and a site diagram marking the location of hazardous material storage areas
- A list of the type of hazardous materials being stored onsite and the storage capacity for each
- Discharge prevention measures, including the procedures for routine handling of hazardous materials
- Discharge or drainage controls such as secondary containment around containers or other structures, equipment, and procedures for the control of a discharge
- Countermeasures for discharge discovery, response, and cleanup
- Methods of disposal of recovered materials in accordance with applicable legal requirements
- A contact list and phone numbers for the Emergency Response Coordinator, cleanup contractors with whom the contractor has an agreement for response, and all appropriate local, state, and federal agencies that must be contacted if a discharge occurs
- Inspection and test procedures; personnel, training, and discharge prevention procedures; and security measures.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## *Control Measures*

The following control measures for spill prevention and response should be implemented at a construction site:

**Spill prevention**—It is very important to be prepared for spills. Spill prevention measures are designed to reduce the chance of spills and to prevent operational error and equipment failure, which cause most spills. Operational errors can be minimized through training programs to maintain a high level of personnel efficiency and awareness of the importance of spill prevention. Personnel who handle oil should be trained on how to properly operate and maintain equipment to prevent discharges. They should also be familiar with discharge procedure protocols; applicable pollution control laws, rules, and regulations; general site operations; and the contents of the site-specific Spill Prevention and Response Plan. Some examples of spill prevention measures to prevent spills and leaks include the following:

- Educate employees and subcontractors on the potential dangers to humans and the environment from spills and leaks. Regular meetings should be held to discuss and reinforce spill prevention and response procedures; this important information can be incorporated into regular safety meetings.
- Designate areas of the construction site specifically for chemical storage. Proponents and contractors should provide storage in accordance with secondary containment requirements and covering for hazardous material where possible. Proponents and contractors should ensure that all storage containers are regularly inspected for leaks, corrosion, support or foundation failure, or any other signs of deterioration.
- Conduct frequent inspections to detect leaks around tank seams, gaskets, rivets, and bolts; flange joints; valves; catch pans; and secondary containment.
- Place in open, conspicuous, and accessible locations the proper storage, cleanup, and spill-reporting instructions for hazardous materials stored or used at the construction site. All personnel should follow proper handling and safety procedures for each type of chemical used.

**Spill control**—Spill-control measures are designed to stop the source of spills, prevent spills from spreading across the site and reaching the marine environment, facilitate cleanup of spills, and minimize environmental impact. Some examples of spill control measures include the following:

- Store chemicals in areas with secondary containment (e.g., dikes, berms, curbing, sumps).
- Keep ample supplies of spill control and cleanup materials onsite, near storage, fueling, and maintenance areas.
- When secondary containment is not present, take action to prevent spills from spreading across the site and/or reaching natural resources (e.g., mangroves, waterways).
- If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Contaminated soil should be dug up and properly disposed of as contaminated soil.
- If the spill occurs when it is raining, cover the spill with tarps or other materials to prevent the contamination of runoff.
- Select biodegradable products when possible and economically feasible.

**Spill response**—If a spill occurs, spill-response measures should immediately be taken to contain, cleanup, and mitigate the effects of a hazardous material spill. Some examples of spill-response measures include the following:

- If a spill occurs, immediately notify the Site Superintendent; the Site Environment, Health, and Safety Supervisor; and appropriate authorities.
- To the extent that the work can be safely accomplished, spills of oil, petroleum products, hazardous materials, and sanitary and septic wastes should be contained and immediately cleaned up.
- Deploy spill booms, absorbent pads, and sorbents to help control and cleanup spills. For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, contact the spill cleanup contractor or local emergency response (e.g., Hazardous Materials Team).
- In compliance with applicable regulations, store and dispose of used cleanup materials, contaminated materials, and recovered spill materials that are no longer suitable for the intended purpose.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Category 4: Waste Management and Materials Pollution Control

Proper management procedures and practices will help to prevent or reduce the discharge of pollutants from solid or liquid wastes that will be generated at a construction site. Practices such as trash disposal, recycling, proper material handling, and spill cleanup measures can reduce the potential for stormwater runoff to pick up construction site wastes and to discharge them into surface waters. The waste management and materials pollution control BMPs for construction sites are as follows: Material Handling and Storage, Solid Waste Management, Sanitary and Septic Waste Management, and Hazardous Waste Management. These previously mentioned BMPs are described in the following paragraphs.

### Material Handling and Storage

Construction materials should be delivered, stored, and used in a manner to prevent them from polluting soil and groundwater, stormwater, or the marine environment. The proponent and/or contractor should maintain an accurate, up-to-date inventory of all materials delivered and stored onsite. Material Safety Data Sheets (MSDSs) for all hazardous materials and liquids used and stored onsite should be readily available. Material lay-down areas should be designed with drainage consideration in mind.

#### *Control Measures*

The following control measures for material handling and storage can be implemented at a construction site:

- Establish proper material handling and staging areas. Paints, solvents, fuels and oils, and other hazardous materials or any building materials that have the potential to contaminate stormwater should be stored indoor or under cover whenever possible and in areas with secondary containment. Proponents and/or contractors should ensure that adequate storage volume is provided and that the area is located as far away as possible from storm drains, natural waterways, and drainage channels (50 feet minimum). Temporary storage sheds should meet building and fire code requirements and should be located away from vehicular traffic. Storage instructions should be posted, and employees should be trained on proper storage and delivery procedures.
- Secondary containment should be constructed so that any discharge from a primary containment system, such as a tank or drum, will not escape the secondary containment before cleanup occurs. Secondary containment for a single container (tank or drum) should be 110% of the primary container. Secondary containment for multiple containers should be 150% of the largest container's volume or 10% of the aggregate volumes of all containers, whichever is greater. Secondary containment should be impervious to spilled wastes.
- Ensure proper storage of hazardous materials. These materials should not be stored on the ground. Instead, the materials should be stored on top of pallets in covered areas with secondary containment. In addition, hazardous materials should always be stored in their original containers with their original product labels attached. Incompatible materials should not be stored in the same temporary storage facility. There should be sufficient space between storage containers to allow for spill cleanup and emergency response access. Equipment storage areas should also be supplied with appropriate spill cleanup materials.

### Solid Waste Management

Materials collected and disposed of onsite in solid waste storage bins should not come in contact with stormwater runoff. Solid wastes include items such as brick, mortar, timber, steel, plastics, empty material containers, and general construction trash or construction debris.

#### *Control Measures*

The following control measures for solid waste management can be implemented at a construction site:

- Stage solid waste at a location that is a minimum of 50 feet from storm drains, natural waterways, or drainage channels. During rain events, waste materials should be stored in water-tight dumpsters and securely covered.
- Reuse and recycle materials whenever possible (e.g., steel, wood, concrete, oil, paper), and prohibit littering at the construction site. Any trash or construction debris at the site should be cleaned up daily.

- Provide adequate trash cans, dumpsters, and bins in the yard; field trailer locations; and areas where employees gather for breaks or meals. Trash cans, bins, or dumpsters should not be placed near natural waterways or drainage inlets or channels. All trash within the construction site should be collected daily, regardless of the litter's origin. Trash should be removed from the site by a licensed solid waste contractor.
- Ensure that an adequate amount of water-tight dumpsters are provided to collect the anticipated volume of construction waste. In addition, waste collection should be scheduled regularly so the containers do not overflow. Also, proponents and contractors should plan for additional dumpsters to be delivered to the site during demolition phases. Washing out dumpsters at the construction site is prohibited.
- Ensure that litter does not clog the storm drainage system by removing debris regularly from drainage grates, trash racks, and ditch lines.
- Separate potentially hazardous waste from non-hazardous waste. Proponents and contractors should ensure that toxic liquid wastes (e.g., used oils, solvents, paints) and chemicals (e.g., acids, pesticides, additives, curing compounds) are not placed in dumpsters designated for construction debris.
- Educate employees and subcontractors, as needed, about solid, hazardous, and toxic waste handling, storage, disposal, and cleanup.

## Sanitary and Septic Waste Management

Accidental sewage releases have the potential to impact soil quality through nutrient enrichment and may also result in human health risks from bacteria and odor. However, the discharge of sewage onto the ground or into drainage systems should not occur because portable, contained toilet facilities must be provided for construction personnel. Sewage from construction and labor camps must also be contained and treated to reduce the chance of an accidental discharge into drainage systems.

### *Control Measures*

The following control measures for sanitary and septic waste management can be implemented at a construction site:

- Provide convenient, well-maintained, and properly located toilet facilities. Portable facilities (e.g., Porta-Johns) should be emptied regularly.
- Locate toilet facilities away from storm drain inlets, waterways, and traffic circulation to prevent accidental spills and contamination of the environment.
- Provide secondary containment pans under Porta-Johns, where possible.
- Provide tie-downs or stake-downs for Porta-Johns in areas of high winds.
- Inform employees, subcontractors, and suppliers about the locations of facilities and the proper procedures for storing and disposing of sanitary and septic wastes.
- Do not discharge or bury wastewater at the construction site. Sanitary and septic waste should be treated or disposed of in accordance with applicable laws and regulations. Reputable, licensed sanitary or septic waste haulers should only be used.
- Provide for regular inspections, service, and disposal. If leaks are identified, repair or replace toilet facilities immediately.

## Hazardous Waste Management

Hazardous waste is material with properties that make it dangerous or potentially harmful to human health and the environment. Hazardous waste management practices should be implemented for projects that generate this material from the use of petroleum products, concrete curing compounds, acids, batteries, paints, solvents, and other materials deemed to be hazardous and in accordance with hazardous waste management laws and regulations. Moreover, hazardous waste must be properly collected, stored, and disposed of to prevent contact with stormwater.

### *Control Measures*

The following control measures for hazardous waste management should be implemented at a construction site:

- Instruct employees and subcontractors on how to identify and properly store and dispose of hazardous waste at a site. Proponents and contractors should ensure that all employees are thoroughly familiar with waste handling and emergency procedures relevant to their responsibilities. One way to ensure their familiarity is to hold regular meetings to discuss and reinforce hazardous waste management procedures; this important information can be incorporated into regular safety meetings.
- Minimize the production or generation of hazardous materials and hazardous waste on the job site.
- Separate potentially hazardous waste from non-hazardous construction site debris. Proponents and contractors should ensure that toxic liquid wastes (e.g., used oils, solvents, paints) and chemicals (e.g., acids, curing compounds) are not placed in dumpsters designated for construction debris. It is important to note that wastes should never be mixed.
- Store hazardous waste in sealed containers constructed of a suitable material. The containers should remain closed during accumulation, except when it is necessary to add waste to the container or remove waste from it. All hazardous waste containers should be clearly labeled with the words “Hazardous Waste” and the date when accumulation began. The type of hazardous waste should also be identified on all waste containers. These containers should be inspected weekly to ensure that they are kept in good condition.
- Designate hazardous waste storage areas onsite and away from storm drains, waterways, and moving vehicles and equipment to prevent accidental spills. All hazardous waste containers should be placed in secondary containment and under cover.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Proponents and contractors should ensure that hazardous waste collection containers are conveniently located.
- Hazardous waste should be disposed of by a licensed, hazardous waste transporter at an authorized and licensed disposal facility or at a recycling facility using a properly completed Hazardous Waste Manifest Form. Rain water in temporary containment areas should be properly disposed of because this may have mixed with hazardous waste.
- Dispose of all empty containers or inner liners, which once contained hazardous waste, as a solid waste. A container or an inner liner is not regulated as a hazardous waste if all of the waste that can be removed has been removed by using common practices (e.g., pouring, pumping, aspirating) and if no more than 1 inch of residue remains in the container (or less than 3% of the volume). Personnel should ensure that all aerosol cans meet the empty condition previously mentioned before discarding. A spray can that contains a hazardous material (e.g., solvent, paint), but that has no remaining propellant gas pressure, may still be considered a hazardous waste.
- Clean up and report hazardous material spills in conformance with the applicable MSDSs and the instructions posted at the construction site.

## Category 5: Dust and Sediment Control

Dust and sediment control BMPs are used to reduce or eliminate fugitive dust emissions and prevent sediment from being discharged into storm drainage system and/or directly into the marine environment during construction. Fugitive dust is emitted during soil-disturbing activities (e.g., excavation, demolition, vehicular traffic, human activity) and from wind erosion over the exposed earth surfaces. If unpaved roadways, stockpiles, and vehicular traffic are not properly controlled, then these can cause a level of airborne dust, which may, in turn, present health hazards and cause traffic safety problems or harm to the environment. Also, deposition of sediment into the marine environment can cloud the water, which reduces the amount of sunlight reaching aquatic plants; clog fish gills; smother aquatic habitat and spawning areas; and impede navigation. Moreover, off-site sedimentation can decrease recreational value, reduce water quality, and increase maintenance costs for stormwater management systems.

### Control Measures

The following control measures for dust and sediment control can be implemented at a construction site:

- Apply water to prevent or minimize the generation of dust.
- Install wind fence around the perimeter of the site.
- Install perimeter sediment controls (e.g., silt fence, sediment barriers, turbidity curtain) adjacent to the marine environment to help prevent sediment from entering the waterways.
- Protect all storm drain inlets that could receive stormwater from the project until final stabilization of the site has been achieved. There are several types of inlet protection available, including, but not limited to, silt fence, gravel and wire mesh, and sand bags.
- Establish stabilized construction entrances and exits to reduce or eliminate the tracking of sediment onto public rights of way or streets. By reducing or eliminating the tracking of sediments and other pollutants onto paved roads, this will help prevent sediments from depositing into local storm drains and producing airborne dust. When sediment is transported onto a paved or public road surface, the road should be cleaned thoroughly at the end of each day.

## Section III. Inspections, Maintenance, and Recordkeeping

## Inspections

Construction site BMPs and good housekeeping and pollution prevention measures depend on consistent and continual inspection and maintenance. The contractor's responsibility does not stop after BMPs are implemented. Structural BMPs should be maintained in good working order at all times. Furthermore, construction permits require that regular inspections are conducted and that the findings of those inspections are documented in the project-specific CEMP.

Each project-specific CEMP describes the minimum frequency of inspections, which is typically weekly. After each inspection, an inspection report should be completed. Copies of all inspection reports should be retained and kept with or in the CEMP. Generally, the following information should be included in an inspection report:

- Inspection date
- Inspector information, including the names, titles, and qualifications of personnel conducting the inspection
- Current weather information and descriptions of any discharges occurring during the inspection
- Descriptions of evidence of previous or ongoing discharges of sediment or other pollutants from the site
- Location(s) of structural BMPs that need to be maintained
- Location(s) of structural BMPs that failed to operate as designed or proved inadequate for the location
- Location(s) where additional BMPs are needed but did not exist during the inspection
- Corrective action(s) required, including any necessary changes to the CEMP and implementation dates
- Reference(s) to past corrective actions documenting follow-up actions taken.

During inspections, digital photographs can be taken to document BMPs, problems identified, and progress in implementing the CEMP.

## BMP Maintenance

Implementing a good BMP maintenance program is essential to the success of a project's CEMP and to the efforts at each construction site to protect the marine environment. Maintenance of BMPs should be conducted regularly and whenever an inspection (formal or informal) identifies a problem or potential issue. For instance, trash and construction debris should be cleaned up, dumpsters should be checked and covered, and nearby streets and sidewalks should be swept daily. Note:

Maintenance of BMPs will vary according to the specific area and site conditions. The following points should be considered when conducting maintenance:

- Follow the designers' or manufacturers' recommended maintenance procedures for all BMPs
- Remove sediment from BMPs as appropriate and properly dispose of it into controlled areas to prevent soil from returning to the BMP during rain events
- Remove sediment from paved roadways and from around BMPs protecting storm drain inlets
- Ensure that construction support activities, including borrow areas, waste areas, contractor work areas, and material storage areas and dedicated concrete and asphalt batch plants are cleaned and maintained
- Replace damaged BMPs, such as concrete washout structures, that no longer operate effectively.

A record of all maintenance activities, including the date, BMP, location, and maintenance performed, should be kept in the CEMP.

## Recordkeeping

Copies of the CEMP, inspection records, and all reports required by the permit should be kept for a period of at least 3 years from the date when the permit coverage expires or is terminated.

Records should include the following:

- A copy of the CEMP and other environmental plans (e.g., Dewatering Plan, Spill Prevention and Response Plan, Waste Management Plan), with any modifications
- Inspection forms, which include the dates, places, and times of the BMP inspections
- The names of the inspectors
- The date, time, exact location, and a characterization of significant observations, including spills and leaks
- BMP maintenance and corrective actions taken at the site
- Monitoring reports
- Weather conditions (e.g., temperature, precipitation)
- Dates when major land-disturbing activities (e.g., clearing, grading, excavating) occurred in an area
- Dates when construction activities either temporarily or permanently ceased in an area.

## References

Auckland Council. 2011 and 2012. Stormwater guides: *Best Management Practice Guidelines for Contractors*. Guides available at http://www.aucklandcouncil.govt.nz/EN/environmentwaste/stormwater/Pages/stormwaterguideshome.aspx.

City of Roseville, California. Public Works Department, Engineering Division. 2011. *Stormwater Quality BMP Guidance Manual for Construction*. Available at http://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=10580.

EAD (Environment Agency–Abu Dhabi). 2010. *Technical Guidance Document for CEMP.* Available at https://www.ead.ae/_data/global/714_1_rti_tgd_cemp_0410_v4.pdf.

State of California Department of Transportation. 2003. *Storm Water Quality Handbooks*. *Construction Site Best Management Practices (BMPs) Manual.* Available at http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf.

U.S. EPA (Environmental Protection Agency). 2012. *Stormwater Discharges from Construction Activities*. Guidance and fact sheets available at http://cfpub.epa.gov/npdes/stormwater/const.cfm.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

U.S. EPA (Environmental Protection Agency). 2007. *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*. EPA-833-R-06-004. Available at http://cfpub.epa.gov/npdes/stormwater/const.cfm.

Washington State Department of Ecology, Water Quality Program. *Concrete Washout Area Best Management Practice.* Ecology's Stormwater Management Manuals available at http://www.ecy.wa.gov/programs/wq/stormwater/construction.

# Best Management Practices (BMP) Technical Guidance Document for Discharges from Construction Activities

## Document Change History

| Doc. No. | Rev. No. | Rev. Date | Revision Description | Page No. | Approved by |
|---|---|---|---|---|---|
| EAD-EQ-PCE-TG-15 | 00 | 14 April 2014 | First Issue | | SG |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Remarks: | | | | | |

## Disclaimer

The information provided on our website is for general information purposes only. While WKC endeavours to provide the most up to date and accurate information, documents and links on our website, we will not be held liable for any loss or damage including without limitation, indirect or consequential loss or damage, or any loss or damage whatsoever arising from the use any of the information provided on our website. For any queries regarding the information on our website, please contact us on enquiries@wkcgroup.com.