DOE–EM/GJRAC1475

Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project
Moab Site Storm Water Pollution Prevention Plan

Revision 4

December 2012

U.S. Department of Energy

Office of Environmental Management

Prepared by the Remedial Action Contractor under contract number DE-DT0002936
for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.

DOE-EM/GJRAC1475

Moab UMTRA Project
Moab Site Storm Water Pollution Prevention Plan

Revision 4

December 2012

Prepared by the Remedial Action Contractor under contract number DE-DT0002936
for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.

Moab UMTRA Project
Moab Site Storm Water Pollution Prevention Plan
Revision 4

Review and Approval

Edward B. Baker — Date 12-18-12
RAC Environmental Compliance Manager

Steve Rima — Date 12-18-12
RAC Environmental Safety, Health, and Quality Manager

Jeff C. Biagini — Date 12-18-12
RAC Project Manager

In concurrence:

Donald R. Metzler — Date 12-20-2012
Moab Federal Project Director

Revision History

Revision No.	Date	Reason/Basis for Revision
0	May 2007	Initial issue.
1	May 2010	Revision includes updates reflecting site construction activities.
2	November 2010	Revision includes updates to Table 1, Sections 4.3, 5.2, 6.0, and to Attachment 2, Tables 2-1 and 2-2.
3	February 2012	Revision includes updates pertaining to cultural resources and endangered species in Section 1.3, updates to Figure 4, and inclusion of new Utah state permit and Notice of Intent in Attachment 1.
4	December 2012	Revision includes update of figures and of Sections 5.2.1 and 5.2.2.

Contents

Section Page

Acronyms and Abbreviations v

1.0 Introduction 1

1.1 General 1

1.2 Purpose 1

1.3 Applicability of Utah General Construction Permit 1

2.0 Site Description 11

2.1 Site Ownership and Physical Location 11

2.2 History 11

2.3 Description 12

2.4 Climate, Soils, and Vegetation 13

2.5 Description of Site Drainage 14

2.5.1 Moab Wash 14

2.5.2 Drainage Basin A 14

2.5.3 Drainage Basin B 15

2.5.4 Drainage Basin C 15

2.5.5 Drainage Basin D 15

3.0 Site Project Descriptions 15

3.1 Description of Ongoing Processes and Site Activities 16

3.1.1 General Site-maintenance Activities 16

3.1.2 Continued Maintenance of Fugitive Dust and Storm-water Runoff Controls 16

3.1.3 Moab Wash Crossings Activity 16

3.1.4 Remediation of Land East and West of Moab Wash 16

3.1.5 Realignment of Moab Wash 16

3.1.6 Hillside Construction 17

3.1.7 Support-area Construction 17

3.2 Post-remediation Site Conditions 17

4.0 Description of Storm-water Controls 17

4.1 Erosion and Sediment Controls 17

4.2 Stabilization Practices 18

4.3 Structural Controls 19

4.4 BMPs 19

5.0 Maintenance, Inspections, and Notifications 21

5.1 Maintenance 21

5.2 Inspections and Notifications 21

5.2.1 Routine Inspections 22

5.2.2 Post-storm Inspections 22

6.0 Records 22

7.0 References 23

Figures

Figure 1. Location of the Moab Site....3
Figure 2. Location of the Colorado River and Wetlands at the Moab Site....5
Figure 3. Storm-water Runoff Controls and Surface Drainage Patterns at the Moab Site....7
Figure 4. Moab Site Construction Map....9

Table

Table 1. Summary of Storm-water and Erosion Controls for the Moab Site....20

Attachments

Attachment 1. UPDES Storm-water Discharge Permit Renewal, Permit Requirements, and Notice of Intent for Storm-water Discharges
Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms
Attachment 3. Examples of Best Management Practices

Acronyms and Abbreviations

ºF	degrees Fahrenheit
BMP	Best Management Practice
BMPA	Best Management Practice Area
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
MOA	Memorandum of Agreement
SIC	Standard Industrial Classification
SR-279	State Route 279
SWP3	Storm Water Pollution Prevention Plan
UAC	Utah Administrative Code
UMTRA	Uranium Mill Tailings Remedial Action
UPDES	Utah Pollutant Discharge Elimination System
US-191	U.S. Highway 191
USACE	U.S. Army Corps of Engineers

1.0 Introduction

1.1 General

The Moab Uranium Mill Tailings Remedial Action (UMTRA) Project site (Moab site) formerly contained a privately operated uranium ore-processing facility that ceased operations in 1984. Radioactive materials, including a large tailings embankment, are remainders from the ore-processing operation. The U.S. Department of Energy (DOE) acquired the site in 2001 and started shipping tailings from the site in 2009 for disposal near Crescent Junction, Utah. The site is located approximately 3 miles northwest of Moab in Grand County, Utah (Figure 1).

The radioactive contaminants (i.e., uranium mill tailings) at the Moab site are best described as a fine-grained, sand-like material that is highly susceptible to wind and water erosion. Consequently, one of DOE's major objectives at the Moab site is to control erosion and contain off-site transportation of these contaminants resulting from the erosive forces of wind and storm water. This Moab Site Storm Water Pollution Prevention Plan (SWP3) outlines DOE's strategy for controlling the off-site transportation of sediment and identifies strategies to protect public waterways from contamination resulting from storm-water runoff at the Moab site. It also describes current site conditions, issues of potential concern that could affect control of discharge of sediment from disturbed areas, and typical maintenance activities and identifies Best Management Practices (BMPs), which, when properly implemented, will help erosion control.

BMPs are those practices that are accepted by industry and the state and federal oversight authorities as effective for controlling sediment transport and thereby managing potential erosion. These may include restrictions related to weather conditions or physical materials that, once in place, will mechanically control movement of soil particles.

1.2 Purpose

The purpose of this SWP3 is to meet state of Utah storm water requirements (described in Section 1.3) and to provide BMPs and guidance related to erosion and storm-water control that can be used as needed for future clean-up and shipping operations at the site. In addition, this plan provides general guidance for managing situations related to weather or other natural situations (e.g., high winds, extreme runoff, loss of surface cover) that may develop and that may require soil stabilization. Exposed soil may potentially result in erosion and thereby compromise the existing ground surface, including exposure of contaminated materials. BMPs are identified for the control of sediment during storm events and to prevent the off-site releases of all sediments. This document proposes guidelines and suggests BMPs that could be applied to future activities.

1.3 Applicability of Utah General Construction Permit

This SWP3 is prepared in accordance with the requirements of the Utah Administrative Code (UAC) Rule R317-8-3.9(6)(d)10, "Utah Pollutant Discharge Elimination System (UPDES), Application Requirements, Storm Water Discharges, Provisions Applicable to Storm Water Definitions."

State of Utah regulations require a UPDES storm-water discharge permit (shown below and in Attachment 1) for "… construction activities including clearing, grading, and excavating…" that result in a land disturbance of one or more acres. The intent of these regulations is to prevent erosion and to prevent or control sediment transport from disturbed areas.

UPDES Storm-water Discharge Permit

STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

Authorization to Discharge Under the
Utah Pollutant Discharge Elimination System

Storm Water General Permit for
Construction Activities
Permit No. UTR300000

This Permit is issued in compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004, as amended (the "Act") and the federal Water Pollution Control Act (33 U.S.C. §§ 1251 *et. seq.*, as amended to date), and the rules and Regulations made pursuant to those statutes.

This Permit authorizes storm water discharges to waters of the State of Utah resulting from construction activities, including construction support activities, anywhere within the State of Utah as provided in Parts 1.4 and 1.5 of this Permit. This authorization is conditioned upon a discharger meeting the eligibility requirements in Part 1.2.2 of this Permit, including preparation of a Storm Water Pollution Prevention Plan prior to filing a Notice of Intent ("NOI") to discharge under this General Permit. A discharger is not covered by this Permit if the discharger submits an NOI but has not met these conditions.

This authorization is subject to the authority of the Utah Water Quality Board or the Executive Secretary of the Utah Water Quality Board to reopen this Permit (*see* Part 5.15 of this Permit), or to require a discharger to obtain an individual permit or use an alternative general permit (*see* Part 2.3 of this Permit). The issuance of a discharge permit authorization under this general Permit does not relieve Permittees of other duties and responsibilities under the Act or rules made under that Act. Significant terms used in this Permit are defined in Part 6 of this Permit.

This Permit shall become effective on July 1, 2008.

This Permit and the authorization to discharge shall expire at midnight, June 30, 2013, except as described in Part 2.4 of this Permit.

Signed this 26th day of June, 2008.

Walter L. Baker, P.E.
Executive Secretary,
Utah Water Quality Board

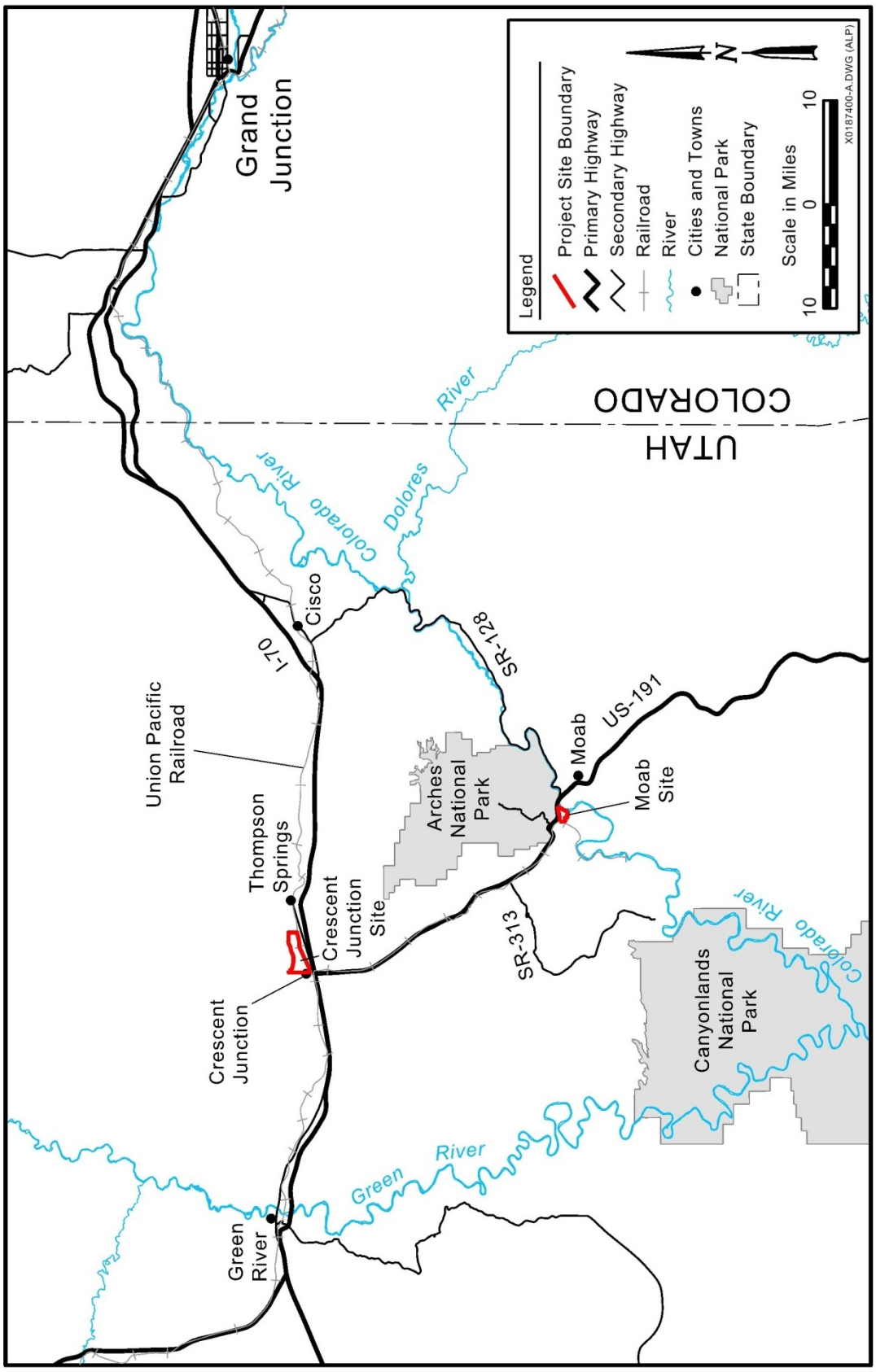


Figure 1. Location of the Moab Site

The UPDES storm-water discharge permit prescribes the content and information to be reported in a site-specific SWP3 is shown below and in Attachment 1, along with permit requirements and the notice of intent for storm-water discharges. In accordance with the terms and conditions of the UPDES storm-water discharge permit, this SWP3 will be kept on site and will be made available to the Executive Secretary (or authorized representative) of the Utah Water Quality Board, interested members of the public, and local government officials. There is no requirement to submit this plan to the state for approval.

In addition to being regulated as a construction site, the Moab site also meets the regulatory definition of a facility that was previously engaged in the mineral industry as described in the Standard Industrial Classification (SIC) codes 1000 through 1400, "Metal Mining." This grouping of industries includes both mining and milling facilities. SIC code 1094 specifically identifies facilities that mined, milled, or otherwise processed uranium, radium, or vanadium ores. These facilities are specifically regulated at UAC R317-8-3.9 (6)(d)(3). These regulations stipulate that a storm-water discharge permit is required for facilities where storm water may "… come into contact with any overburden, raw materials, intermediate products, finished products, by-products or waste products located on the site of such operations."

This SWP3 addresses activities and operations currently conducted or planned for the future by the DOE at the Moab site. The plan conforms to current state of Utah rules and requirements for controlling erosion and storm-water discharges associated with construction activity (e.g., construction sites) as described above.

Figure 2 shows the locations of the Colorado River and wetland areas at the site, and Figure 3 shows site drainage patterns and locations of specific storm-water runoff control BMPs that will be maintained on site. Figure 4 shows a site map with site features. The information provided in this SWP3 complies with the format and outline required by the UPDES storm-water discharge permit.

As revisions to this plan become necessary, they will be added to the text and documented on the Revision History (page ii). Revisions or modifications to the plan must be incorporated within 7 days following an inspection.

In addition to complying with the state of Utah UPDES requirements, this plan also complies with all applicable DOE guidance and orders, including DOE Order 436.1, "Departmental Sustainability." Class I and Class III cultural resource inventories were conducted on the Moab site as required by Title 16 United States code Section 470 (16 USC 470), the National Historic Preservation Act. DOE completed the Section 106 consultation process and developed a Memorandum of Agreement (MOA) with the Utah State Historic Preservation Office and the Utah Department of Transportation.

An annual report is prepared pursuant to the MOA as shown in Section 3.1.13 of the *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Final Environmental Impact Statement, Volume 1* (DOE/EIS-0355) (EIS). In compliance with the Endangered Species Act (16 USC 1531), DOE prepared a Biological Assessment, and the U.S. Fish and Wildlife Service prepared a Biological Opinion, which is appended to the Project EIS (see EIS Section 3.1.11).

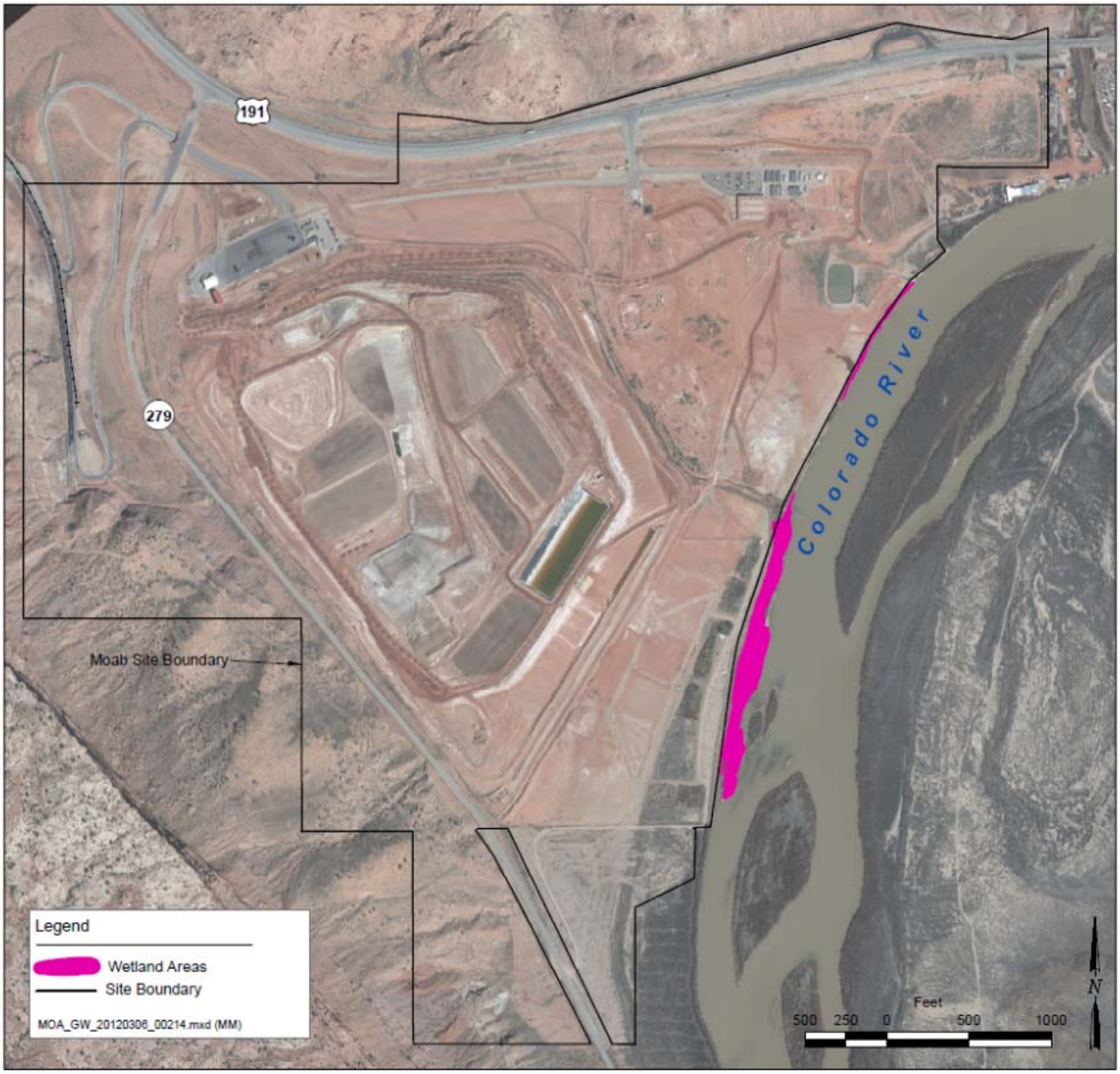


Figure 2. Location of the Colorado River and Wetlands at the Moab Site

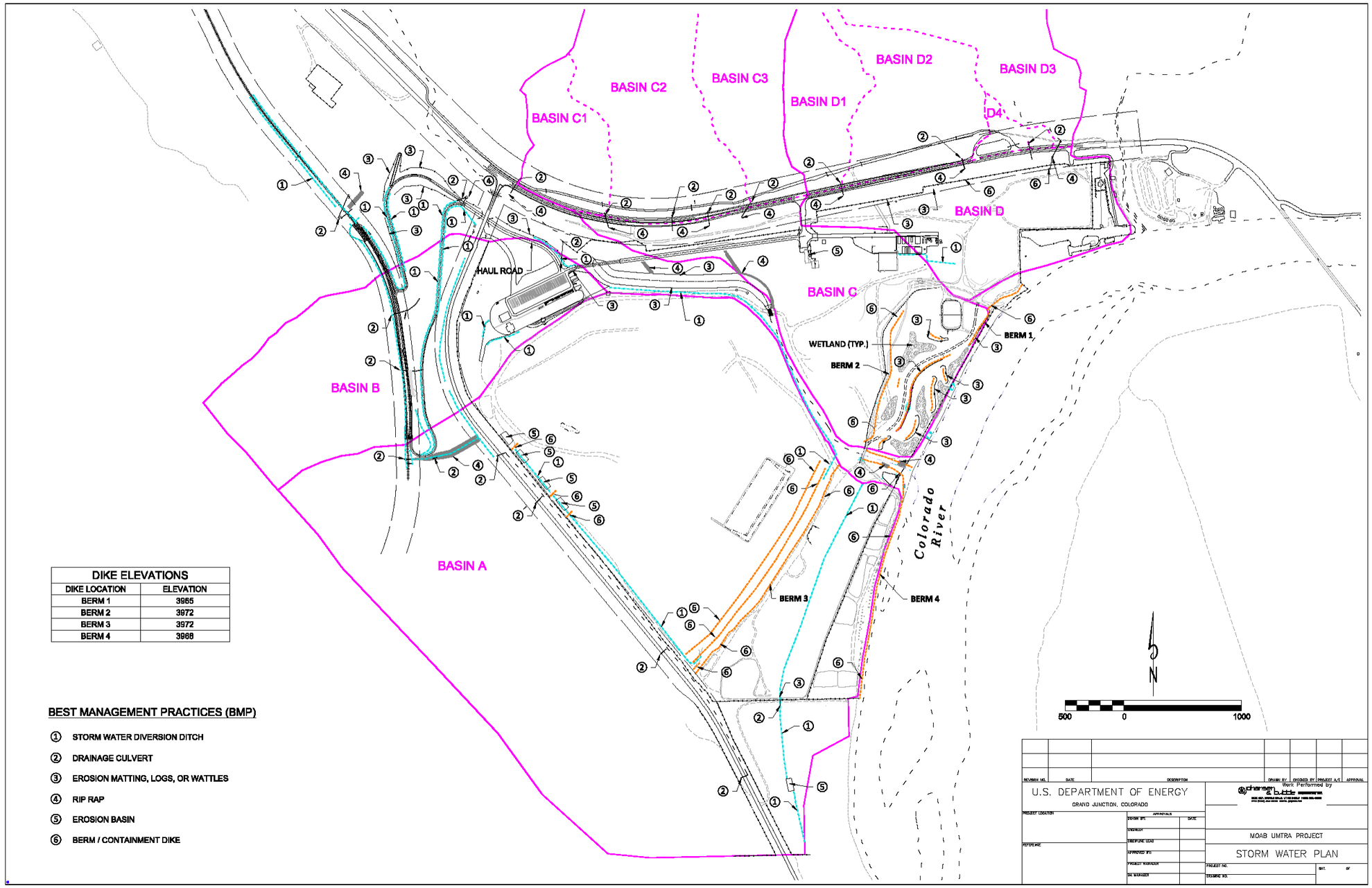


Figure 3. Storm-water Runoff Controls and Surface Drainage Patterns at the Moab Site

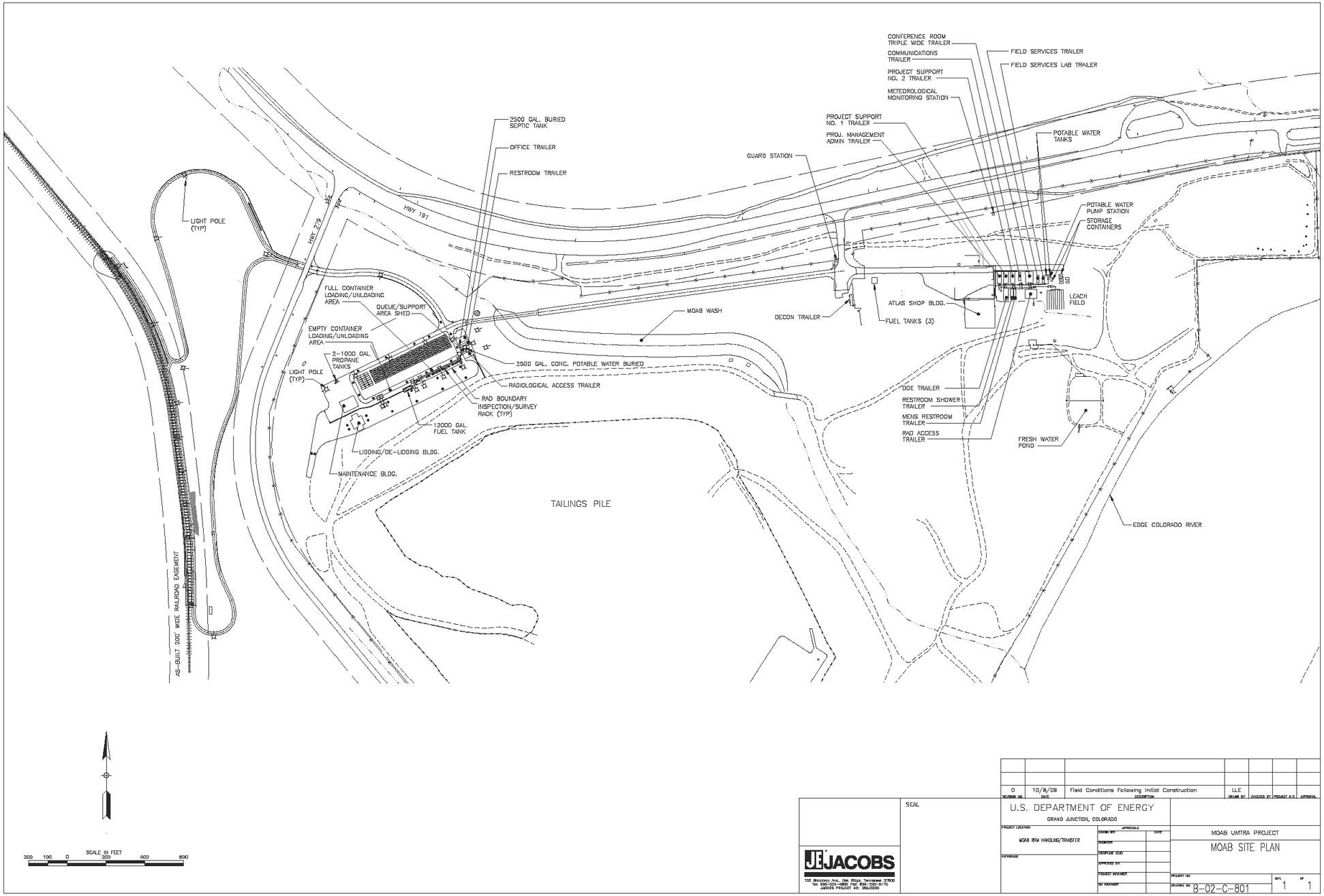


Figure 4. Moab Site Construction Map

2.0 Site Description

2.1 Site Ownership and Physical Location

As required by the Utah Division of Water Quality, the following site ownership information is provided.

Name of Operation
Moab UMTRA Project site (formerly known as the Atlas Uranium Mill)

Owner/Operator Information
U.S. Department of Energy, Grand Junction Office
200 Grand Avenue, Suite 500
Grand Junction, Colorado 81501
DOE Contact: Donald R. Metzler (970) 257-2115
Contractor Regulatory Contact: Ed Baker (435) 260-6177
On-site Contact: Dennis Dalga (435) 719-2805

Physical Address of Operations
2021 North U.S. Highway 191 (US-191), Moab, Utah 84532

Longitude/Latitude of Operation (Moab Office)
Latitude: 38 degrees, 36 minutes, 17.53329 seconds North
Longitude: 109 degrees, 35 minutes, 23.47893 seconds West
Elevation: 3,977.6 feet above mean sea level

2.2 History

The Moab site consists of a former uranium ore-processing facility that was originally owned and operated by the Uranium Reduction Company and later by the Atlas Minerals Corporation. The mill ceased operations in 1984 and was subsequently dismantled with the exception of one building that DOE currently uses for maintenance. Although the former mill is no longer active, a total of approximately 12 million cubic yards of uranium mill tailings and surface-contaminated soils remain at the Moab site. The majority of the mill tailings are contained within an on-site tailings embankment, the footprint of which covers approximately 130 acres. The top of the embankment averages 94 feet above the Colorado River. Although the milling process recovered about 95 percent of the uranium, the residues, or tailings, contain several naturally occurring radioactive elements. Decommissioning of the mill began in 1988, and an interim cover was placed on the tailings pile between 1989 and 1995.

To minimize potentially adverse effects to human health and the environment in the short term, DOE instituted environmental controls and began various interim measures in 2002. Controls have included storm-water management, dust suppression, pile-dewatering actions, and placement of an interim cover on the tailings to prevent movement of contaminated windblown materials from the pile. In 2005, an EIS was completed and approved; it describes proposed actions related to moving the contaminated materials from the existing processing site to a selected disposal site, located approximately 30 miles north on US-191, at Crescent Junction, Utah.

2.3 Description

The Moab site is generally irregularly shaped and is situated between the Colorado River and US-191. The entire property consists of 479 acres, with the disturbed portion of the site covering an estimated 350 acres; the remaining approximately 129 acres are predominately located on the hillside west and above State Route 279 (SR-279). The uranium mill tailings embankment covers 130 acres and is located west of the Moab Wash.

The Moab site is bordered on the north and southwest by steep sandstone cliffs. The Colorado River forms the southeastern boundary of the site. US-191 parallels the northern site boundary, and SR-279 parallels the southwestern boundary. Arches National Park is located adjacent to the northern site boundary, and Canyonlands National Park is located approximately 12 miles to the southwest. The Cane Creek Branch of the Union Pacific Railroad traverses a small section of the site just west of SR-279. Figure 1 provides general location information.

The majority of the eastern portion of the Moab site has been remediated, and there are ongoing efforts to establish native vegetation to maintain a stable soil surface and reduce fugitive dust and erosion as delineated in the *Moab UMTRA Project Fugitive Dust Control Plan* (GJO-MOA 1.7-1). A new construction water/irrigation pond was created in this area in 2006, and the former pond was removed. Major construction activities for support (administration), shipping (lidding/delidding) facilities, haul road, underpass, and rail load-out facilities were constructed in 2008 and 2009.

Buildings on the site include various components of the Project, such as offices, restrooms, laundry facilities, maintenance buildings, and a decontamination area. Surrounding the buildings is a basically flat remediated area that is being stabilized with vegetation. A pump inlet structure is situated along the Colorado River, approximately 1,200 feet northeast of the Moab Wash. The construction water/irrigation pond, which occupies approximately 2 acres, is south of the central building area. The majority of the area east of the Moab Wash is flat.

The Moab Wash is a major ephemeral, surface-water feature that runs in a southeasterly direction through the center of the site and empties into the Colorado River. The wash flows only during and after precipitation events. During periods of high water, the Moab Wash and the area south of the wash may be used as preferred habitat by two endangered fish, the Colorado pikeminnow (*Ptychocheilus lucius)* and the razorback sucker (*Xyrauchen texanus*). A backwater area parallel to the river and the mouth of the Moab Wash is inundated during high river flow. Berms isolate all runoff from the tailings embankment into a sediment basin to avoid river and backwater area contamination.

Jurisdictional wetlands, regulated by the U.S. Army Corps of Engineers (USACE), occur along the southeastern Moab site boundary adjacent to the Colorado River. They are protected from possible contaminated site runoff by existing berms that parallel the river. The Colorado River 100-year floodplain can potentially flood large areas of the southeastern portion of the site. The floodplain and the location of wetlands are shown on Figure 2.

The Moab site has been divided into four drainage basins based on the 25-year storm event. These drainage basins are shown on Figure 3 with the BMPs for controlling erosion and elevations of berms to control storm events. Figure 4 illustrates the majority of the facilities constructed during the past 4 years.

2.4 Climate, Soils, and Vegetation

The climate of the Moab region is semiarid. The average annual temperature is approximately 56 degrees Fahrenheit (ºF). January is the coldest month, averaging 30ºF, and July is the warmest month, averaging 82ºF. Extreme temperatures have ranged from -18ºF in January 1963 to 111ºF, which has occurred more than once (in July 1953 and on earlier occasions). Temperatures of 90ºF or higher occur about 100 days per year, with about 80 percent of those occurring during June, July, and August. Temperatures below freezing occur on an average of 123 days of the year, with about 80 percent of those occurring during November through February.

Average annual precipitation at Moab is 9 inches, distributed approximately equally among the seasons, with slight peaks during the spring and fall. The driest months are February and June, which have precipitation slightly less than 0.5 inch. The wettest months are October and April, which have average precipitation of about 1.15 inch and 1 inch, respectively. Annual precipitation is greatly exceeded by potential evapotranspiration (about 50 inches per year annually), potential or pan evaporation (about 60 inches annually), and lake evaporation (about 38 inches annually). Thunderstorms occur about 40 days per year. Hail occurs approximately 3 days per year.

Prevailing winds in the Moab region are from the southwest and southeast. The highest wind speed recorded at Moab was 80 miles per hour. Cold air drainage at the Moab site could occur from the northwest under very stable conditions.

Surface soils on relatively flat disturbed areas of the sites are predominately sands mixed with clays, silts, and gravels and are saturated within 16 feet of the surface most of the year. Most of the native soils are classified as Nakai fine, sandy loams. Soils include sandy loams to loamy, fine sands. Soils are generally deep (depths greater than 36 inches), are well drained, and have a minimal water-erosion potential, a moderate hazard of blowing potential, and an estimated erosion rate of 3 tons per acre per year. Surrounding steep slopes are mainly rocky slopes with high runoff potential. There are also steep, sandy slopes on a small portion of the site with high runoff and erosion potential.

The runoff coefficient for unimproved, vacant lands for the given soil type may be as low as 0.05 according to the Denver Regional Council of Governments “Urban Storm Drainage Criteria Manual.” However, the runoff coefficient for steep, rocky slopes, buildings, and parking lots can be as high as 0.9. The runoff coefficient after completion of construction activities remains essentially the same.

Most of the vacant areas that were contaminated have been remediated and reclaimed by seeding and planting with native species. Disturbed areas surrounding the railroad load-out area, roads, Support Area, and administration areas have been seeded and mulched. There is minimal vegetation growing on the tailings embankment or on the majority of the disturbed sites.

Areas along the Colorado River are dominated by riparian and wetland species, such as tamarisk, cottonwood and willow. Scattered desert plant communities dominate steep areas west of SR-279 and north of US-191. The riparian areas with wetlands will not be disturbed.

2.5 Description of Site Drainage

The Moab site was divided into four drainage basins for design of BMPs to control drainage across the site and into sediment basins for evaporation. These basins are shown on Figure 3 and are discussed below. The physical extent of the drainage basins is based on computer modeling of upslope and off-site topography and expected surface runoff.

The Moab Wash bisects the site from a northwesterly to southeasterly direction and is a common boundary for three of the drainage basins. Because it connects to the Colorado River, the Moab Wash is physically segregated from interconnection with any of the drainage basins.

2.5.1 Moab Wash

The Moab Wash forms one boundary for Drainage Basins A, B, and C. Surface runoff will be prevented from entering the Moab Wash through the use of straw and rock wattles and/or drainage ditches along perimeter areas of the wash. The Moab Wash is the major drainage feature for on-site surface runoff, but it also transports and discharges runoff with sediment collected from a large off-site area.

The Moab Wash contains an ephemeral stream that flows only during or after major storm events. It is DOE's goal to control and prevent surface and storm-water runoff and/or sediment originating on the Moab site property from entering the Moab Wash. As a result, the only sediment that will be discharged to the Colorado River through the Moab Wash will be sediment and runoff collected from the watershed areas upstream of the Moab site.

DOE obtained appropriate permits and realigned the Moab Wash from the middle crossings to the northern property boundary and from the lower crossing to the Colorado River. Three Moab Wash crossings, two open crossings, and a culvert crossing were upgraded.

2.5.2 Drainage Basin A

Drainage Basin A contains the tailings embankment and areas to the west and across SR-279. These areas are variably sloped, and surface runoff will drain through culverts between 24 and 36 inches in diameter, which are shown on Figure 3. The surface runoff is channeled southeasterly to an excavated area within the tailings pile and to berms on the outer slope of pile to isolate storm water from reaching the Colorado River. Between the river and the berms are jurisdictional wetlands and the backwater areas previously described that are potentially important nursery areas for endangered Colorado River fish.

The majority of Drainage Basin A is characterized by loose, poorly consolidated sediments. There is poor vegetative cover in some areas and no vegetation on the tailings embankment itself. The areas across SR-279 are often steep with some rock outcrops. The tailings embankment area is the location where most of the anticipated on-site activity or disturbance will occur. Because both the native soils and uranium mill tailings possess a sand-like texture, these materials are easily eroded. Water is used to control fugitive dust on the pile.

2.5.3 Drainage Basin B

Drainage Basin B includes the area to the northwest of the tailings pile and the area including the contain load-out area (also known as the Support Area), and area west of SR-279. Extensive construction activities were performed in this area to develop the Support Area, haul road, and railroad load-out bench. The full containers are shipped from the Support Area just north of the tailings pile on a haul road through an underpass, up the hill to a rail load-out facility, and trans-loaded to a rail car; empty containers are loaded on trucks and returned on a second haul road. Much of the terrain west of the highway could be characterized as steep with rocky outcrops.

2.5.4 Drainage Basin C

This drainage area is divided into three smaller basins, all of which originate north of US-191 on DOE land, and extends into Arches National Park. Four 24- to 30-inch-diameter culverts will channel surface runoff under the highway and toward containment area C onto the Moab site. At the downslope edge of the culverts, rock was placed to prevent undercutting of the culvert and to control runoff onto the DOE site. Areas to the north of the highway are steep and rocky.

The majority of Drainage Basin C has been remediated and is being stabilized by native vegetation. This area contains the site entrance and the majority of the site facilities. A construction water pond that is also used for irrigation water to maintain site vegetation is in this area.

Berms segregate surface runoff from reaching the Colorado River. As shown on Figure 2, there are jurisdictional wetlands between the river and the berms.

2.5.5 Drainage Basin D

Drainage Basin D is also comprised of several smaller basins, which are shown on Figure 3. This basin includes a large off-site area that is part of Arches National Park and is basically bounded by the Courthouse Wash on the eastern side. Four culverts drain surface runoff below US-191. The culvert outlets were protected from undercutting with rock riprap, and drainage ditches onto DOE property were protected with erosion matting. The areas north of the highway are generally steep and rocky, while the majority of the site south of the highway is basically flat and has been vegetated with native perennial species.

3.0 Site Project Descriptions

The extent and nature of construction activities at the Moab site depends on the specific construction activities and sequencing developed by the Remedial Action Contractor. However, it is anticipated that 350 acres will be disturbed as a result of various construction and remedial activities. Typical current and anticipated activities and disturbed areas are described below and summarized on Table 1.

3.1 Description of Ongoing Processes and Site Activities

Currently, DOE continues to ensure erosion controls are in place and working as intended at the Moab site. As the Project progresses, various new erosion- and sediment-control devices will be implemented as necessary. Ongoing site activities and their potential to contribute to storm-water discharges are discussed in Sections 3.1.1 through 4.3.

3.1.1 General Site-maintenance Activities

DOE continues to conduct surface and ground water monitoring, radon and direct-gamma radiation monitoring, radioparticulate monitoring, and meteorological monitoring. Most of the monitoring activities are ongoing and non-intrusive and result in little to no new land disturbance.

Another maintenance activity is ensuring all berms are stable and able to contain the 25- and 100-year storm events. The berms also act as sediment basins for each of the four drainage basins. Berms are found on the southeastern portion of the site and at the toe of the tailings embankment.

In addition, native vegetation plantings require irrigation watering and monitoring for noxious weed infestations. Occasionally, new areas are planted or replanted as needed to stabilize exposed soil areas. Other maintenance activities may include fence or sign maintenance.

3.1.2 Continued Maintenance of Fugitive Dust and Storm-water Runoff Controls

DOE recognizes that mill tailings and residual radioactive contaminated soils are especially vulnerable to wind and storm runoff. In an effort to contain these contaminants and prevent off-site migration, maintaining fugitive dust and storm-water runoff controls is a priority. Maintenance of these controls and the addition of new controls may necessitate the use of heavy equipment. New land disturbances associated with these activities are expected to be minimal.

3.1.3 Moab Wash Crossings Activity

Stabilizing and creating safe crossings of the Moab Wash crossings occurred during the 2007-2008 time frame. The installation of five 48-inch culverts at the middle crossing, an open concrete rock-lined overflow at the lower crossing, and an open rock-lined overflow at the upper crossings were completed. The top of the middle crossing is weir-shaped to handle large discharges and was stabilized with grouted rock for safe vehicle travel.

3.1.4 Remediation of Land East and West of Moab Wash

Approximately 5 acres were remediated east of the Moab Wash in 2008-2009. In 2010 and 2011, DOE remediated approximately 35 acres of contaminated soil south of the tailings embankment, below the lower crossing Moab Wash, and an area west of Moab Wash. Contaminated soils were removed, and areas were revegetated with native species. Storm-water drainage and controls were re-established following remediation.

3.1.5 Realignment of Moab Wash

To reduce the potential for contaminated soil and tailings to move off site into the Colorado River, DOE completed the realignment of the upper half of the Moab Wash under a USACE 404 Permit. Section 404 of 33 USC 1251, the Clean Water Act, authorizes the USACE to issue Section 404 Permits for activities conducted in wetlands or other U.S. waters.

As a result of the re-alignment activities, the channel-flow capacity was increased (for the 100-year storm event), and the banks were stabilized with vegetation, erosion matting, and rock armoring, thus reducing erosion potential. In general, grading and ditching was used to minimize sheet flow into the Moab Wash to minimize contamination into the wash. The remainder of the wash will be widened, and contaminated soils will be remediated.

3.1.6 Hillside Construction

In 2008-2009, major construction activities were completed on the hillside northwest of the tailings embankment. Facilities constructed include a railroad load-out bench, haul roads (separate uphill and downhill routes), and an underpass of SR-279. Culverts, riprap drainages, and retainer walls were constructed to control runoff. Extensive amounts of erosion matting, blankets, and logs were installed to control sediment loss. All disturbed areas were seeded and mulched to provide temporary and long-term soil stabilization. More than 30 acres were involved in this activity.

3.1.7 Support-area Construction

In 2008-2009, the Support Area or container load-out area was constructed. The area is for trans-loading containers from the contaminated areas to the clean area and for transporting containers to the rail load-out area. Facilities include the lidding/delidding facility, shop, asphalt storage area, and support offices. Approximately 5 acres are associated with the Support Area.

3.2 Post-remediation Site Conditions

It is anticipated that completion of transportation of the tailings embankment and soil remediation will take 10 to 20 years or more, depending on funding. However, after all areas have been stabilized, surface conditions shall be returned to the pre-development conditions of relatively flat topography. The anticipated future use of the Moab site is a park-like setting that would contain riparian and desert vegetation communities dominated by saltbrush and Indian ricegrass communities.

4.0 Description of Storm-water Controls

Because the Moab site contains significant quantities of contaminated materials (e.g., uranium mill tailings, residual radioactive material) and because a large percentage of the site has been previously disturbed and is susceptible to severe erosion, DOE's primary objective is to contain all on-site runoff to the greatest extent practicable.

Figure 3 illustrates the surface drainage patterns and the storm-water and erosion controls that will be used at the Moab site. Storm-water and erosion controls to be implemented at the Moab site are summarized below, and details for each practice are provided in Attachment 2.

4.1 Erosion and Sediment Controls

Tailings Embankment Temporary Cover

The temporary cover installed on the tailings embankment reduces erosion and subsequent off-site transportation of the mill tailings. The cover is generally between 6 and 12 inches thick and consists mostly of sandy soils with low-level contamination excavated from on-site borrow sources.

The cover itself is susceptible to erosion, because no vegetation has been established on the tailings pile. It is anticipated that periodic maintenance will be required to prevent cover materials from eroding (primarily from the side slopes).

On-site Berms
Berms have been constructed along the DOE property boundary adjacent to the Colorado River and Moab Wash to intercept sheet flow and contain storm-water runoff. The berms are sized to prevent storm-water runoff from reaching the adjacent Colorado River. Figures 3 and 4 provide the location of the berms that extend from the southeastern corner of the property to the southwest of the DOE boundary property.

Rock Armoring and Chemical-binding Agents
Use of rock materials for armoring slopes, bank stabilization, culverts, and check dams will be used as appropriate. Chemical agents (e.g., magnesium chloride, calcium chloride) will be used on designated roads to maintain them in good usable condition and to prevent rutting and tracking of sediment.

Erosion-control Matting, Blankets, and Wattles
Erosion-control matting or turf-reinforcement mat, natural or synthetic blankets, and straw and rock wattles will be used to provide soil stabilization after disturbance. Matting and blankets also provide improved microclimate conditions to enhance establishment of vegetation.

Silt Fencing
A synthetic silt fence fabric will be used whenever additional sediment and erosion controls are needed to augment existing controls or wherever the above controls cannot be feasibly implemented. Silt fencing will be deployed along the toe of exterior slopes to filter storm-water runoff. Silt fencing is a structural measure that is intended to complement and enhance soil stabilization (erosion control) measures and reduce sediment discharges from storm-water runoff.

4.2 Stabilization Practices

Vegetative Buffer Strip
The UPDES storm-water discharge permit specifically identifies the preservation of existing areas of vegetation as valuable storm-water buffer and sediment-stabilization controls. Almost the entire length of the eastern Moab site boundary is bordered by the Colorado River. This border contains a dense growth of tamarisk, willows, and other wetland and riparian vegetation. This strip of vegetation serves as an efficient filter of storm water and sediment and is an effective natural barrier between the disturbed portions of the Moab site and the nearby Colorado River. DOE will make every attempt to preserve and re-establish the native vegetation along the Colorado River to ensure site sediments, contaminants, and runoff are contained on site.

Vegetation
As various on-site areas are remediated, native vegetation will continue to be planted to stabilize and protect bare soil areas. Ongoing vegetation maintenance (e.g., irrigation, fertilization) and noxious weed control will continue.

Chemical Stabilizers

Various soil-stabilizing agents may be approved for use in areas where sediments are particularly vulnerable to erosion, such as the tailings pile cover, side slopes, soil borrow areas, and in areas where significant activity is expected (e.g., site roads). Soil stabilizers/conditioners may include various chemical-based agents and surfactants (e.g., polymers, calcium/magnesium chloride, lignum sulfate, tackifiers).

4.3 Structural Controls

Storm-water and Sediment-retention Areas

Four storm-water berms and sediment-retention basins are in place at the Moab site that are designed to capture and contain on-site storm-water runoff and sediment. These areas are:

1. The top of the tailings embankment itself is inverted and captures runoff that falls directly on top.
2. The bermed areas immediately south, east, and north of the tailings embankment will capture runoff from the western site boundary and from the side slopes of the embankment.
3. The bermed area east of the Moab Wash.
4. The berm that runs parallel to the Colorado River and acts as a containment structure to isolate runoff and sediment from reaching the river. The river berm acts as a perimeter control for Drainage Basins C and D.

Site Drainage and Grading

All drainage features at the Moab site will be routinely evaluated to identify whether site-drainage controls require adjustments, improvements, or repairs as part of the storm-water inspection process. The inspection process will determine if certain areas are in need of ongoing maintenance to ensure site drainage does not discharge to the Moab Wash or to the Colorado River. These maintenance actions may entail: grade adjustments; culvert installations and repair; installation and repair of berms and dikes; installation of straw/rock wattles and rock riprap; installation of sediment catch basins; installation of erosion matting or blankets; and installation of runoff interception ditches. Table 1 provides a summary of storm-water and erosion controls for the Moab site.

4.4 BMPs

BMPs shown on Figure 3 will be followed at the Moab site to help minimize on-site erosion and off-site sediment discharge. Table 2-1 in Attachment 2 describes inspection and maintenance requirements of various BMPs that may be used at the Moab site. Selected BMPs are described below.

Roads

All on-site traffic will be restricted to specific designated roads, which are shown on Figure 4. Off-road travel will only be authorized on a case-by-case basis (e.g., to access remote monitoring wells, to conduct radiological assessments). Traffic speed will also be restricted to an appropriate level on all designated roads.

Table 1. Summary of Storm-water and Erosion Controls for the Moab Site

Sediment Source		Storm-water Controls								
		Earthen Berms	Storage and Containment	Vegetative Cover	Chemical-based Soil Stabilizers	Anchored Straw Wattles, Silt Fencing	Rock Armor (Riprap, Gravel, Rock Wattles)	Other (Fiber Mat, Tackifier, Rock Check Dam)	Drainage Improvements (Grading, Ditches, Culverts)	No Controls
High Potential Areas	Tailings Pile (Top, Sides)		X		X			X		
	Hillside (Bench and Slopes)	X	X	X	X		X	X	X	
	Support Areas		X	X	X		X	X	X	
	Moab Wash Corridor	X		X		X	X	X	X	
Moderate Potential Areas	North and East Portions of Moab Site	X		X	X	X	X	X	X	
	Site Roads				X		X	X	X	
Low Potential Areas	US-191 and SR-279 Corridors (East and North)	X		X			X	X	X	
	River Bottom/ Wetland Areas (South/East)									X
	Sandstone Slopes/Cliffs (East/South)									X

Evaluation of Chemical-based Soil Stabilizer Use

Use of various chemical soil stabilizers/dust suppressants (e.g., surfactants, salt-based soil conditioners) shall be done in accordance with the recommended end uses for those products. Site personnel shall not exceed the manufacturer-recommended application rates. Material Safety Data Sheets for all such materials used at the Moab site shall be reviewed and approved by Environmental Compliance. Before application, site personnel shall determine and evaluate if the use of the soil conditioner could interfere with other site monitoring activities or cause other harm to the environment (e.g., runoff into critical habitat for threatened or endangered fish).

Decontamination

Before leaving the Moab site, all heavy equipment and vehicles are washed and decontaminated at a decontamination pad. This practice minimizes the potential for any off-site tracking of sediment or contaminants.

Covered Loads
Any trucks hauling materials off the site shall be covered to minimize fugitive dust and the loss of materials in transit. All loads shall be inspected to ensure they are properly covered before departure.

Spill Response
In the event of an off-site spill or release of contaminated materials, the spilled materials will be immediately contained and cleaned up. Emergency spill response actions are outlined in Section 12.0 of the *Moab UMTRA Project Health and Safety Plan* (DOE-EM/GJ1038).

Best Management Practice Areas
Best Management Practice Areas (BMPAs) were established at the Moab site for the purposes of consolidating various types of waste materials requiring segregation (e.g., petroleum-contaminated soils, asbestos wastes). Isolating and consolidating such wastes into designated material-storage areas minimizes the potential that contaminants exposed to storm-water runoff will be further dispersed into the environment.

5.0 Maintenance, Inspections, and Notifications

5.1 Maintenance

Recommended maintenance activities per type of erosion or sediment control are provided in Table 2-1 in Attachment 2, "Maintenance and Inspection Requirements." This table provides general specifications and requirements. In addition, examples of BMPs with appropriate installation methods and applicability are provided in Attachment 3, "Examples of Best Management Practices."

5.2 Inspections and Notifications

Site personnel will inspect all storm-water controls for evidence of damage (e.g., replacement of straw and rock wattles, additional silt fencing needed, repair of berms, cleaning plugged culverts). Using the inspection forms (see Attachment 2), site personnel will document the condition of the storm-water controls and any maintenance actions that may be necessary after each inspection. Any required maintenance actions must be reported to the On-site Manager within 24 hours of the inspection. The On-site Manager will ensure the appropriate repairs or maintenance actions are performed in a timely manner. Inspections of disturbed areas may be done at any time; however, the UPDES defines mandatory inspections described below.

In the event of a major release of contaminated material (e.g., breach of a storm-water retention basin containing contaminated runoff water), the inspector(s) will immediately notify the On-site Manager and follow the emergency reporting and notification procedures as outlined in Section 12.0 of the *Health and Safety Plan* and the *Moab UMTRA Project Incident and Occurrence Reporting Procedure* (DOE-EM/GJ1549).

5.2.1 Routine Inspections

As required by the UPDES storm-water discharge permit, Environmental Compliance staff shall inspect the disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural-control measures, and locations where vehicles enter or exit the site. Environmental Compliance staff will conduct inspections at least once every 14 days or before anticipated storm events. However, for areas temporarily stabilized and where runoff is unlikely due to winter conditions or during seasonal arid conditions, inspections will be conducted monthly.

The results of routine inspections are recorded on the "Routine Erosion and Sediment Control Inspection Form" (see Attachment 2). If the site is found to be in compliance with this SWP3, then the inspector shall sign the inspection form, certifying compliance.

Areas that have been seeded shall be inspected once a month during the growing season to ensure measures related to vegetation success are in place and that seeding efforts have not been compromised by weeds or other factors. The "Moab Site Environmental Erosion Control and Revegetation Inspection Form" (see Attachment 2) provides inspection requirements.

5.2.2 Post-Storm Inspections

Within 24 hours of the end of a storm with precipitation of 0.25 inches or greater, the site erosion- and sediment-control features shall be inspected by trained Environmental Compliance staff or field engineers and recorded on the "Moab Site Post-storm Erosion and Sediment Control Inspection Form" (see Attachment 2) and notify the On-site Manager within 24 hours of the inspection. Precipitation data from an on-site meteorological monitoring station will be used to determine the intensity and duration of storm events and recorded on Table 2-3 in Attachment 2.

6.0 Records

Project records generated as a result of this plan will be created and managed in accordance with the *Moab UMTRA Project Records Management Manual* (DOE-EM/GJ1545) and the Moab working files index and plan and include:

- Moab Site SWP3.
- UPDES storm-water discharge permit.
- Routine or post-storm erosion and sediment control inspection checklists.
- General correspondence related to storm-water discharges or permitting.

All copies of inspections shall be made and retained as part of this plan for at least 3 years from the date of final site stabilization. Any incidents of non-compliance must be described and recommendations noted on the forms. If any inspections result in a change to the site description, modifications to this plan must be made within 7 calendar days.

7.0 References

16 USC 470 (United States Code), "National Historic Preservation Act."

16 USC 1531 (United States Code), "Endangered Species Act."

33 USC 1251, (United States Code), "Clean Water Act."

Denver Regional Council of Governments, *Urban Storm Drainage Criteria Manual, Volume 1*, "Urban Drainage and Flood Control District," September 1978.

DOE (U.S. Department of Energy) *Moab UMTRA Project Fugitive Dust Control Plan* (GJO-MOA 1.7-1), March 2002.

DOE (U.S. Department of Energy) *Moab UMTRA Project Health and Safety Plan* (DOE-EM/GJ1038), August 2012.

DOE (U.S. Department of Energy) *Moab UMTRA Project Incident and Occurrence Reporting Procedure* (DOE-EM/GJ1549), March 2011.

DOE (U.S. Department of Energy) *Moab UMTRA Project Records Management Manual* (DOE-EM/GJ1545), November 2012

DOE (U.S. Department of Energy) Order 436.1, "Departmental Sustainability."

DOE (U.S. Department of Energy) *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Final Environmental Impact Statement*, *Volume 1* (DOE/EIS-0355), July 2005.

SIC (Standard Industrial Classification) Codes 1000 through 1400, "Metal Mining."

UAC (Utah Administrative Code) R317-8-3.9(6)(d)10, "Utah Pollutant Discharge Elimination System (UPDES), Application Requirements, Storm Water Discharges, Provisions Applicable to Storm Water Definitions."

Attachment 1.
Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges

UPDES Storm Water Discharge Permit Renewal

STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

Authorization to Discharge Under the
Utah Pollutant Discharge Elimination System

Storm Water General Permit for
Construction Activities
Permit No. UTR300000

This Permit is issued in compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004, as amended (the "Act") and the federal Water Pollution Control Act (33 U.S.C. §§ 1251 *et. seq.*, as amended to date), and the rules and Regulations made pursuant to those statutes.

This Permit authorizes storm water discharges to waters of the State of Utah resulting from construction activities, including construction support activities, anywhere within the State of Utah as provided in Parts 1.4 and 1.5 of this Permit. This authorization is conditioned upon a discharger meeting the eligibility requirements in Part 1.2.2 of this Permit, including preparation of a Storm Water Pollution Prevention Plan prior to filing a Notice of Intent ("NOI") to discharge under this General Permit. A discharger is not covered by this Permit if the discharger submits an NOI but has not met these conditions.

This authorization is subject to the authority of the Utah Water Quality Board or the Executive Secretary of the Utah Water Quality Board to reopen this Permit (*see* Part 5.15 of this Permit), or to require a discharger to obtain an individual permit or use an alternative general permit (*see* Part 2.3 of this Permit). The issuance of a discharge permit authorization under this general Permit does not relieve Permittees of other duties and responsibilities under the Act or rules made under that Act. Significant terms used in this Permit are defined in Part 6 of this Permit.

This Permit shall become effective on July 1, 2008.

This Permit and the authorization to discharge shall expire at midnight, June 30, 2013, except as described in Part 2.4 of this Permit.

Signed this 26th day of June, 2008.

Walter L. Baker, P.E.
Executive Secretary,
Utah Water Quality Board

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Storm Water Permit Requirements

TABLE OF CONTENTS

PART 1: PERMIT SCOPE AND COVERAGE 3
1.1 Persons Required to Obtain Authorization for Discharge. 3
1.2 Permit Area and Eligibility. 3
1.3 Authorization to Discharge. 3
1.4 Allowable Storm Water Discharges 3
1.5. Allowable Non-storm Water Discharges. 4
1.6 Discharges Not allowed Under This Permit 4
1.7 Authorization to Discharge Date 5
1.8 Notice of Intent 5
1.9 Coverage Before October 1, 2008 5
1.10 Late Notifications 6
PART 2. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, RESPONSIBILITIES, AND OTHER NON-NUMERIC LIMITATIONS 7
2.1 Releases in Excess of Reportable Quantities. 7
2.2 Discharge Compliance with Water Quality Standards and TMDL Requirements 7
2.3 Requiring an Individual Permit or an Alternative General Permit 8
2.4 Continuation of the Expired General Permit 9
PART 3. STORM WATER POLLUTION PREVENTION PLANS 10
3.1. SWPPP Required. 10
3.2. SWPPP Location, Availability, Revision, and Signature 10
3.3. Keeping SWPPPs Current 11
3.4. More Than One Permittee 11
3.5. Contents of SWPPP. 12
PART 4 . TERMINATION/CHANGES IN OWNER/OPERATOR FOR SITE 19
4.1. Termination of Coverage 19
4.2. Conditions for Submitting an NOT 19
4.3. Updating the SWPPP
PART 5. STANDARD PERMIT CONDITIONS 20
5.1. Duty to Comply 20
5.2. Duty to Reapply 20
5.3. Need to Halt or Reduce Activity Not a Defense 20
5.4. Duty to Mitigate 20
5.5. Duty to Provide Information 20
5.6. Other Information. 20
5.7. Oil and Hazardous Substance Liability 21
5.8. Property Rights. 21
5.9. Severability 21
5.10. Record Retention 21
5.11. Addresses. 21
5.12. State Laws. 21
5.13. Proper Operation and Maintenance 21
5.14. Inspection and Entry 22
5.15 Reopener Clause. 22
5.16. Signatory Requirements. 22
PART 6. DEFINITIONS 24

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Permit Requirements (continued)

PART 1: PERMIT SCOPE AND COVERAGE

1.1 Persons required to obtain authorization for discharge. No person may conduct construction activities that disturb an area greater than or equal to one acre without authorization for storm water discharge from the Executive Secretary. (*See* Utah Admin. Code Sections R317-8-3.9(6)(d)(10) and R317-8-3.9(6)(e)(1).) In addition, no person may conduct construction activities that disturb an area smaller than one acre if the disturbance is part of a larger common plan of development or sale that will ultimately disturb an area greater than or equal to one acre. *Id.* *See* Part 6.5 of this Permit for a definition of "construction activities."

1.2 Permit Area and Eligibility.

1.2.1. Construction activities located within the State of Utah, except for Indian Country (*see* Part 6.16 of this Permit for a definition of "Indian Country") may be eligible to be covered under this Permit.

1.2.2. Eligibility for authorization to discharge under this Permit is conditioned upon:

a. Preparation of a Storm Water Pollution Prevention Plan ("SWPPP") (see Part 3 of this permit) prior to submission of a Notice of Intent ("NOI");

b. Submission of a complete and a ccurate Notice of Intent to be covered by this Permit (see Part 1.8 of this Permit); and

c. Payment of applicable fees.

1.3 Authorization to Discharge. This Permit authorizes discharges of storm water from construction activities that disturb an area greater than or equal to one acre, and from construction activities that disturb an area smaller than one acre if the disturbance is part of a larger common plan of development or sale that will ultimately disturb an area greater than or equal to one acre. This authorization is subject to all of the terms and conditions of this Permit, including the requirement that the discharger must submit a Notice of Intent ("NOI"), and the prohibitions on discharges specified in Part 1.6.

1.4 Allowable Storm Water Discharges. Subject to compliance with the terms and conditions of this Permit, a Permittee is authorized to discharge pollutants in:

1.4.1. Storm water associated with construction activity as that term is defined in Part 6.5 of this Permit (but see Part 1.4.3 of this Permit for limitations on discharges from construction support activities);

1.4.2. Storm water discharges designated by the Executive Secretary as needing a storm water permit under R317-8-3.9(6)(e)(2);

1.4.3. Discharges from construction support activities as that term is defined in Part 6.6 of this Permit, provided:

a. The support activity is directly related to the construction site required to have UPDES permit coverage for discharges of storm water associated with construction activity;

b. The support activity is not a commercial operation serving multiple unrelated construction projects by different owners/operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and

c. Appropriate controls and measures are identified in a Storm Water Pollution

Prevention Plan (SWPPP) covering the discharges from the support activity areas; and

1.4.4. Discharges composed of allowable discharges listed in Part 1.4 and 1.5 of this Permit commingled with a discharge authorized by a different UPDES permit and/or a discharge that does not require UPDES permit authorization.

1.5. Allowable Non-storm Water Discharges. A Permittee is authorized to make the following non-storm water discharges, provided the non-storm water component of the discharge is in compliance with Part 3.5.5 of this Permit:

1.5.1. Discharges from fire-fighting activities;
1.5.2. Fire hydrant flushings;
1.5.3. Waters used to wash vehicles where detergents are not used;
1.5.4. Water used to control dust in accordance with Part 3.5.2(c)(2);
1.5.5. Potable water including uncontaminated water line flushings;
1.5.6. Routine external building wash down that does not use detergents;
1.5.7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
1.5.8. Uncontaminated air conditioning or compressor condensate;
1.5.9. Uncontaminated ground water or spring water;
1.5.10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
1.5.11. Landscape and other irrigation drainage.

1.6 Discharges not allowed under this Permit. Notwithstanding any other language in this Permit, the following storm water discharges are not authorized by this Permit:

1.6.1. Discharges from Construction Activities within Indian Country. This Permit does not cover discharges within Indian Country as that term is defined in Part 6.16 of this Permit;[1]
1.6.2. Post Construction Discharges. Storm water discharges that originate from the site after construction activities have been completed and the site has undergone final stabilization;
1.6.3. Discharges Mixed with Non-storm Water. Discharges that are mixed with sources of non-storm water other than discharges which are identified in Part 1.5 of this Permit and in compliance with Part 3.5.5 (non-storm water discharges) of this Permit;
1.6.4. Discharges Covered by Another Permit. Storm water discharges associated with construction activity for which an individual permit has been issued, or for which the owner/operator is required to or may obtain coverage under an individual permit or an alternative general permit (*see* Part 2.3 of this Permit), including a general

---

[1] The State of Utah, *Division of Water Quality*, does not have permit authority for Indian Country. Storm water permits for Indian Country within the State must be acquired through EPA Region VIII, except for facilities on the Navajo Reservation or on the Goshute Reservation which must acquire storm water permits through EPA Region IX.

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Permit Requirements (continued)

permit issued for areas regulated by a qualified municipal Separate Storm Sewer System Program;

1.6.5. Discharges Threatening Water Quality. Storm water discharges from construction activities that cause or have the reasonable potential to cause a violation of a water quality standard. *See* Part 2.2 of this Permit;

1.6.6. Discharges from commercial construction support and related activities. Storm water discharges from construction support activities unless they are included within the definition in Part 6.6 of this permit;

1.6.7. Spills. This Permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill; and

1.6.8. Discharges that result from violations of this Permit.

1.7 Authorization to Discharge Date.

1.7.1. This permit is effective as of July 1, 2008 and is effective for five years, expiring at 11:59 p.m. on June 30, 2013.

1.7.2. Unless notified by the Executive Secretary to the contrary, a discharger is authorized for coverage under this Permit and may begin construction activities immediately after preparing a SWPPP for the construction activities (*see* Part 1.2.2(a) of this Permit), and after submitting an NOI and permit fee (*see* Part 1.2.2(b) and (c) of this Permit). The date of submission of the NOI or a permit fee shall be the date of its receipt by the Executive Secretary, or the date the NOI or permit fee are submitted electronically using the website for the Utah Division of Water Quality. Any NOIs mailed to the Executive Secretary shall be mailed to the address specified in Part 5.11 of this Permit.

1.7.3. The Executive Secretary may, with written notice (including electronic notice) delay authorization to verify an applicant's eligibility or resolve other concerns. In these instances, a discharger is not authorized for coverage under this permit until it receives notice from the Executive Secretary.

1.8 Notice of Intent

1.8.1. A person who wishes to submit an NOI must use the NOI form provided by the Executive Secretary (or a copy thereof), or submit an NOI electronically (see (https://secure.utah.gov/stormwater/)).

1.8.2. All questions in an NOI form provided by the Executive Secretary or answered in the course of submitting an NOI electronically must be answered completely and accurately.

1.8.3. The NOI, whether on the form provided by the Executive Secretary or submitted electronically, must include a certification statement, and must be signed and dated by an authorized representative as specified in Part 5.16 of this Permit.

1.9 Coverage before June 30, 2010. Permittee's that previously received authorization to discharge under the October 1, 2002 General Permit (2002 General Permit) and still have active coverage shall without submission of an NOI continue coverage under UTR200000 until June 30, 2010 at which time, or before if desired, the Permittee shall, by submission of an NOI (either on-line www.waterquality.utah.gov/updes/stormwatercon.htm or by paper submission) obtain coverage under this Permit (UTR300000).

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Permit Requirements (continued)

1.10 Late Notifications. Persons are not prohibited from submitting NOIs after initiating clearing, grading, excavation activities, or other construction activities. When a late NOI is submitted, authorization for discharges occurs consistent with Subpart 2.1. The Agency reserves the right to take enforcement action for any un-permitted discharges that occur between the commencement of construction and discharge authorization.

PART 2. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, RESPONSIBILITIES, AND OTHER NON-NUMERIC LIMITATIONS

2.1 Releases in excess of Reportable Quantities. The discharge of hazardous substances or oil in the storm water discharge(s) from a site shall be prevented or minimized in accordance with the applicable SWPPP for the site. This Permit does not relieve the Permittee of the reporting requirements of 40 CFR part 117, 40 CFR 110, and 40 CFR part 302. Where a release containing a hazardous substance in an amount equal to or in excess of a reportable quantity established under either 40 CFR 117, 40 CFR 110, or 40 CFR 302, occurs during a 24 hour period:

2.1.1. The Permittee is required to notify the National Response Center (NRC) (800-424-8802) in accordance with the requirements of 40 CFR 117, 40 CFR 110, and 40 CFR 302 and the Division of Water Quality (DWQ) (801-538-6146) or the 24 hour DWQ answering service at 801-536-4123 as soon as he or she has knowledge of the discharge;

2.1.2. The Permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, the measures taken and/or planned to be taken to cleanup the release, and steps to be taken to minimize the chance of future occurrences to the Executive Secretary; and

2.1.3. The SWPPP required under Part 3 of this Permit must be modified within 14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the SWPPP must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the SWPPP must be modified where appropriate.

2.2 Discharge Compliance with Water Quality Standards and TMDL requirements. Storm water discharges from construction activities that cause or have the reasonable potential to cause a violation of a water quality standard or a violation of Total Maximum Daily Load ("TMDL") requirements are not authorized by this Permit. If there is a TMDL requirement for the receiving water, that requirement, rather than a water quality standard, will govern. If a discharge that would otherwise be covered by this Permit causes a violation or if there is a reasonable potential a discharge will cause a violation, the Permitteee will take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard or a TMDL requirement, and shall document these actions in the SWPPP.

If the Executive Secretary determines that construction activities have caused or have the reasonable potential to cause a violation of a water quality standard or a TMDL requirement, the discharger will be notified by the Executive Secretary of additional requirements for treatment or handling of the discharge to ensure future discharges do not cause or contribute to the violation. The Permittee will document these requirements in the SWPPP. The Executive Secretary may authorize continued coverage under this Permit after appropriate controls and implementation procedures, designed to bring the discharges

into compliance with water quality standards or TMDL requirements, have been included in the SWPPP.

Alternatively, the Executive Secretary may notify the Permittee that an individual permit application is necessary (see Part 2.3 of this Permit).

If violations remain or re-occur, then coverage under this Permit may be terminated by the Executive Secretary and an alternative permit may be issued or denied. Compliance with this requirement does not preclude any enforcement activity as provided by the Water Quality Act for the underlying violation.

2.3 Requiring an Individual Permit or an Alternative General Permit.

2.3.1. The Executive Secretary may require any person authorized by this Permit to apply for and/or obtain either an individual UPDES permit or an alternative UPDES general permit. Any interested person may petition the Executive Secretary to take action under this paragraph. Where the Executive Secretary requires a discharger authorized to discharge under this Permit to apply for an individual UPDES permit, the Executive Secretary shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form or reference to the application requirements, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of issuance or denial of the individual UPDES permit or the alternative general permit as it applies to the individual Permittee, coverage under this general Permit shall automatically terminate. Applications shall be submitted to the address of the Division of Water Quality shown in Part 5.11 of this Permit. The Executive Secretary may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual UPDES permit application as required by the Executive Secretary under this paragraph, then the applicability of this Permit to the individual UPDES permittee is automatically terminated at the end of the day specified for application submittal.

2.3.2. Any discharger authorized by this Permit may request to be excluded from the coverage of this Permit by applying for an individual permit. In such cases, the discharger shall submit an individual application in accordance with the requirements of Utah Administrative Code ("UAC") R317-8-3.9(2)(b)2 with reasons supporting the request, to the Executive Secretary at the address for the Division of Water Quality in Part 5.11 of this Permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the Permittee are adequate to support the request.

2.3.3. When an individual UPDES permit is issued to a discharger who would otherwise be subject to this Permit, or the discharger is authorized to discharge under an alternative UPDES general permit, the applicability of this Permit to the individual UPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization for coverage under the alternative general permit, whichever the case may be. When an individual UPDES permit is denied to a discharger otherwise subject to this Permit or the discharger is denied for coverage under an alternative UPDES general permit, the applicability of this Permit to the

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Permit Requirements (continued)

individual UPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Executive Secretary.

2.4 Continuation of the Expired General Permit. This Permit expires on June 30, 2013. However, an expired general permit shall continue in force and effect after the expiration date until a new general permit is issued. If a discharger was eligible for and permitted under this Permit, and this Permit expires, the discharger will remain covered by this Permit until the earliest of:

2.4.1. One hundred twenty days after re-issuance or replacement of this Permit;
2.4.2. The discharger submits a Notice of Termination in compliance with this Permit;
2.4.3. The discharger is issued an individual permit for the project's discharges; or
2.4.4. 180 days after the Executive Secretary makes a formal decision not to reissue or replace this Permit, at which time the discharger must seek coverage under an alternative general permit or an individual permit.

PART 3. STORM WATER POLLUTION PREVENTION PLANS

3.1. SWPPP required. A Storm Water Pollution Prevention Plan ("SWPPP") shall be developed for each construction project covered by this Permit prior to submission of an NOI. A SWPPP shall be prepared in accordance with good engineering practices. It is recommended that the plan be signed by a Professional Engineer (P.E.) registered in the State. The SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site, shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges associated with construction activity at the construction site and to assure compliance with the terms and conditions of this Permit, and shall otherwise meet the requirements of this Permit. As a condition of this Permit, Permittees must implement the SWPPP as written or modified from commencement of construction until final stabilization is complete and an NOT has been submitted. (This provision is not intended to address the potential liability of a Permittee or other current or former operator or owner in the event of a discharge of pollution from the property of an individual homeowner.)

3.2. SWPPP Location, Availability, Revision, and Signature.

3.2.1. SWPPP Location. A copy of the SWPPP, including a copy of the Permit, the NOI, and any amendments to the SWPPP, shall be retained on-site at the site which generates the storm water discharge in accordance with this Part 3.2 and with Part 5.10 of this Permit. If the site is inactive or does not have an onsite location adequate to store the copy of the SWPPP, reasonable local access to a copy of the SWPPP during normal working hours (e.g., at a local library or government building), must be provided and the location of the SWPPP, along with a contact phone number, shall be posted on site at a publicly-accessible location. For linear construction projects, such as pipelines, the posted notice shall be located at a publicly accessible location near the active part of the construction project.

3.2.2. SWPPP Availability. The Permittee shall make the copy of the SWPPP that is kept on-site or kept locally available for review upon request to the Executive Secretary; EPA; other local agencies approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or to the operators of a municipal separate storm sewer receiving discharges from the site. The Permittee need not provide a free copy of the SWPPP to these entities upon request, but if it chooses not to do so, it shall keep two copies of the SWPPP, in its entirety, and shall allow these entities to borrow one to make a copy at their own expense.

3.2.3. Original SWPPP. If requested by the Executive Secretary, the original SWPPP, including any previous versions requested, shall be provided to the Executive Secretary within five working days of the request. The original provided shall be signed in accordance with Part 5.16 of this Permit.

3.2.4. SWPPP Availability to the Public. The Permittee shall also make a copy of the SWPPP available to the public to review at reasonable times during regular business hours. Advance notice by the public of the desire to view the SWPPP may be required, not to exceed two working days. The Permittee need not provide a free copy of the SWPPP to members of the public, but if it chooses not to do so, it shall

keep two copies of the SWPPP, in its entirety, and shall allow members of the public to borrow one to make a copy at their own expense.

3.2.5. Compelled Revisions. The Executive Secretary, or an authorized representative of the Executive Secretary, may notify the Permittee (co-Permittees) at any time that the SWPPP does not meet one or more of the minimum requirements of this Part 3. Such notification shall identify those provisions of the Permit which are not being met by the SWPPP, and identify which provisions of the SWPPP require modifications in order to meet the minimum requirements of this Part 3. Within 7 days of such notification from the Executive Secretary, (or as otherwise provided by the Executive Secretary), or authorized representative, the Permittee shall make the required changes to the SWPPP and shall submit to the Executive Secretary a written certification that the changes have been made. The Executive Secretary may take appropriate enforcement action for the period of time the Permittee was operating under a SWPPP that did not meet the minimum requirements of the Permit.

3.2.6. All SWPPPs must be signed and certified in accordance with Part 5.16 of this Permit.

3.3. Keeping SWPPPs Current.

3.3.1. The Permittee shall amend the SWPPP whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the discharge of pollutants to the waters of the State and which has not otherwise been addressed in the SWPPP.

3.3.2. The Permittee shall amend the SWPPP whenever inspections or investigations by site operators, local, state, or federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under Part 3.5.1 of this Permit, or is otherwise not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity.

3.3.3. The Permittee shall amend the SWPPP whenever a new owner/operator becomes responsible for implementing all or part of the SWPPP, as further described in Part 3.4 and Part 4.3 of this Permit.

3.3.4. The following records of activities shall be maintained as part of the SWPPP:

a. Dates when major grading activities occur;
b. Dates when construction activities temporarily or permanently cease on a portion of or all of the site; and
c. Dates when stabilization measures are initiated.

3.3.5. Once an area has been finally stabilized, the Permittee may identify this area in the SWPPP and no further SWPPP or inspection requirements shall apply to that area.

3.4. More than one Permittee. A SWPPP may identify more than one Permittee and may specify the responsibilities of each Permittee by task, area, and/or timing. Permittees may coordinate and prepare more than one SWPPP to accomplish this. However, in the event there is a requirement under the SWPPP for which responsibility is ambiguous or is not included in the SWPPP(s), each Permittee shall be responsible for implementation of that requirement. Each Permittee is also responsible for assuring that its activities do not render another Permittee's controls ineffective.

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Permit Requirements (continued)

3.5. Contents of SWPPP. The SWPPP shall include the following items:

3.5.1. Site Description. Each SWPPP shall provide a description of pollutant sources and other information as indicated:

a. A description of the nature of the construction activity;
b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. grubbing, excavation, grading, utilities, and infrastructure installation);
c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities, including areas for construction support;
d. An estimate of the runoff coefficient of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;
e. A general location map (e.g. portion of a city or county map or similar scale) and a site map indicating:
    1) drainage patterns and approximate slopes anticipated after major grading activities;
    2) construction boundaries and a description of existing vegetation prior to grading activities;
    3) areas of soil disturbance, and areas of no disturbance;
    4) the location of major structures and nonstructural controls identified in the SWPPP;
    5) Locations of areas used for construction support;
    6) the location of areas where stabilization practices are expected to occur;
    7) the location of surface waters (including wetlands); and
    8) locations where storm water is discharged or will discharge to a surface water;
f. A description of any discharge associated with industrial activity other than construction at the site (including storm water discharges from dedicated portable asphalt plants and dedicated portable concrete plants), whether or not those discharges are covered by the Permit; and the location of that activity;
g. The name of the receiving water(s), and aerial extent of wetland acreage at the site; and
h. A copy of this Permit.

3.5.2. Controls. The SWPPP shall employ best management practices to control pollutants in storm water discharges. Each plan shall include a description of appropriate controls and measures that will be implemented during construction activity and while the site is unstabilized. The plan must clearly describe for each major activity identified in Part 3.5.1(b) appropriate control measures and the timing during the construction process that the measures will be implemented. The description and implementation of controls shall address the following minimum components:

a. Erosion and Sediment Controls.
    1) Short and Long Term Goals and Criteria:
        A) The construction-phase erosion and sediment controls should be designed to retain sediment on site to the maximum extent

practicable.

B) All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, incorrectly, or is ineffective the Permittee must replace or modify the control for site situations.

C) If sediments escape the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize the possibility of offsite impacts such as fugitive sediments washing into storm sewers by the next rain or posing a safety hazard to users of public streets.

D) Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.

E) Litter, construction debris, and construction chemicals exposed to storm water shall be picked up prior to anticipated storm events (e.g. forecasted by local weather reports), or otherwise prevented from becoming a pollutant source for storm water discharges (e.g. screening outfalls, picked up daily, etc.).

F) Offsite material storage areas (also including overburden and stockpiles of dirt, etc.) used solely by the Permitted project are considered a part of the project and, unless a Permittee submits a separate NOI for such areas or they are subject to a separate UPDES permit, they shall be addressed in the SWPPP.

2) Stabilization Practices. A description of existing interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. SWPPPs should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geo-textiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Use of impervious surfaces for stabilization should be avoided. Except as provided in paragraphs (A) and (B) below (Parts 3.5.2(a)(2)(A) and (B)), stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

   A) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.

   B) Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of the site.

3) Structural Practices. The permittee shall provide a description of

structural practices that divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Placement of structural practices in floodplains should be avoided to the degree attainable. The installation of these devices may be subject to Section 404 of the federal Clean Water Act ("CWA").

A) 10 Acre Sediment Basin Requirement. Where attainable, for common drainage locations that serve areas with 10 or more acres disturbed at one time, the Permittee shall provide a temporary (or permanent) sediment basin that provides storage for a 10 year, 24 hour storm event, a calculated volume of runoff for disturbed acres drained, or equivalent control measures, until final stabilization of the site. Where calculations are not performed, a sediment basin providing 3,600 cubic feet of storage per acre drained (a 1 inch storm event), or equivalent control measures, shall be provided where attainable until final stabilization of the site. The required sizing of the sediment basin does not include flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is attainable, factors such as site soils, slope, and available area on site shall be considered. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps (with comparable storage) must be used; or

   (i) at a minimum, equivalent controls in silt fences, vegetative buffer strips, sod, mulch, geo-textiles, stepped check dams, pipe slope drains or other sediment or erosion controls are required for all erodible areas, down slope boundaries of the construction area and side slope boundaries deemed appropriate as dictated by individual site conditions; or

   (ii) it can be shown that site meteorological conditions do not warrant equivalent storage during the time period the 10-acres are destabilized (little or no chance of precipitation for the period of surface destabilization).

B) Less Than 10 Acre BMP Requirement. For drainage locations serving less than 10 acres, sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for

3,600 cubic feet of storage per acre drained is provided.

b. Storm Water Management. Description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA. This Permit only addresses the installation of storm water management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed and the site has undergone final stabilization. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site. However, post-construction storm water BMPs that discharge pollutants from point sources once construction is completed, may in themselves, need authorization under a separate UPDES permit and are likely regulated under local municipal requirements.
   1) Such measures may include:
      A) storm water detention structures (including wet ponds);
      B) storm water retention structures;
      C) flow-attenuation by use of open vegetated swales and natural depressions;
      D) infiltration of runoff onsite; and
      E) sequential systems (which combine several practices).
   2) The SWPPP shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.
   3) Storm water velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel for the purpose of providing a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected. The objective is to minimize significant changes in the hydrological regime of the receiving water.

c. Other Controls.
   1) Waste Disposal. No solid materials, including building materials, shall be discharged to waters of the State, except as authorized by a federal CWA Section 404 permits.
   2) Off-site Tracking. Off-site vehicle tracking of sediments and the generation of dust shall be minimized.
   3) Septic, Waste, and Sanitary Sewer Disposal. The SWPPP shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.
   4) Exposure to Construction Materials. The SWPPP shall include a narrative description of practices to reduce pollutants from construction related materials which are stored onsite including an inventory of construction materials (including waste materials), storage practices to minimize exposure of the materials to storm water, and spill prevention and

response.

5) Support Areas. A description of pollutant sources from areas other than construction (including storm water discharges from dedicated portable asphalt plants and dedicated portable concrete plants), and a description of controls and measures that will be implemented at those sites.

d. Other Laws and Requirements.

1) Local Storm Water Control Requirements. This Permit does not relieve the Permittee from compliance with other laws effecting erosion and sediment control or requirements for the permanent storm water system. Where applicable, compliance efforts to these requirements should be reflected in the SWPPP.

2) Threatened or Endangered Species & Historic Properties. This Permit does not relieve the Permittee from compliance with Federal or State laws pertaining to threatened or endangered species or historic properties. Where applicable compliance efforts to these laws should be reflected in the SWPPP.

3) Variance of Permit Requirements. Dischargers seeking alternative permit requirements shall submit an individual UPDES permit application in accordance with applicable law to the address indicated in Part 5.11 of this Permit, along with a description of why requirements in this Permit should not be applicable as a condition of a UPDES permit.

3.5.3. Maintenance. All vegetation, erosion and sediment control measures and other protective measures identified in the SWPPP shall be maintained in effective operating condition. A description of procedures to ensure the timely maintenance of these measures shall be identified in the SWPPP. Maintenance needs identified in inspections or by other means shall be accomplished before the next anticipated storm event, or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.

3.5.4. Inspections.

a. Inspections must be conducted in accordance with one of the two schedules listed below. The Permittee shall specify in its SWPPP which schedule it will be following.

1) At least once every 7 calendar days; or

2) At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

b. Inspection frequency may be reduced to at least once every month if:

1) The entire site is temporarily stabilized; or

2) Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen).

c. The inspection requirement is waived until one month before thawing conditions are expected to result in a discharge if all of the following requirements are met:

1) The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month);

2) Land disturbance activities have been suspended; and
3) The beginning and ending dates of the waiver period are documented in the SWPPP.

d. Inspections must be conducted by qualified personnel (provided by the operator or cooperatively by multiple operators). "Qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity.

e. Inspections must include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors must look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Sedimentation and erosion control measures identified in the SWPPP must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

f. Inspections at construction sites involving utility line installation, pipeline construction, and other long, narrow, linear construction may be more limited if the areas described in Part 3.5.4(e) of this Permit are not reasonably accessible or could cause additional disturbance of soils and increase the potential for erosion. In these circumstances, controls must be inspected at the same frequency as other construction projects, but personnel may instead inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. In the absence of evidence to the contrary, the conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.

g. For each inspection required above, the inspector must complete an inspection report. At a minimum, the inspection report must include:
1) The inspection date;
2) Names, titles, and qualifications of personnel making the inspection;
3) Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
4) Weather information and a description of any discharges occurring at the time of the inspection;
5) Location(s) of discharges of sediment or other pollutants from the site;

6) Location(s) of BMPs that need to be maintained;
7) Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
8) Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
9) Corrective action required including any changes to the SWPPP necessary and implementation dates.

h. A record of each inspection and of any actions taken in accordance with this Part 3 must be retained as part of the SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the construction project or site is in compliance with the SWPPP and this permit. The report must be signed in accordance with Part 5.16 of this Permit.

3.5.5. Non-Storm Water Discharges. Except for flows from fire fighting activities, sources of non-storm water listed in Part 1.5 of this Permit that are combined with storm water discharges associated with industrial activity must be identified in the SWPPP. The SWPPP shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Permit Requirements (continued)

PART 4. TERMINATION/CHANGES IN OWNER/OPERATOR FOR SITE

4.1. Termination of Coverage: Permittees may or shall (as specified) terminate coverage under this Permit under the following conditions:

4.1.1. Completion of construction activities and site stabilization: Permittees shall terminate coverage under this Permit by submitting a Notice of Termination ("NOT") within thirty days after completion of all construction activities, completion of final stabilization of all areas of the site as defined in Part 6.15. The NOT shall be submitted on the form specified by the Executive Secretary.

4.1.2. Partial completion of construction activities and site stabilization: A Permittee who, as specified in Part 3.4 of this Permit, is identified in the SWPPP as responsible for a specific area may terminate coverage under this Permit by submitting an NOT within thirty days after completion, for that area, of all construction activities, completion of final stabilization of all areas for which the Permittee was responsible and that were disturbed. The NOT shall be submitted on the form specified by the Executive Secretary, and the Permittee shall indicate on the form that it is a partial NOT.

4.1.3. New responsible owner/operator: A Permittee may terminate its coverage under this Permit by submitting an NOT if another party (or parties) assumes responsibility for all remaining SWPPP requirements. Termination of the Permittee's responsibilities under the SWPPP will not be final until the other party (or parties) submits an NOI. If the new responsible owner/operator fails to submit an NOI, the Permittee may complete termination by demonstrating to the Executive Secretary that it has entered into contracts that obligate the new owner/operator to undertake all remaining responsibilities under the SWPPP.

4.2. Conditions for Submitting an NOT: A Permittee may not submit an NOT unless it meets the requirements specified in Part 4.1. Appropriate enforcement actions may be taken if an NOT is submitted without these requirements having been met, and the Permittee may also continue to be responsible for any Permit violations.

4.3. Updating the SWPPP: If an NOT is submitted under Part 4.1.2 or 4.1.3, the SWPPP shall be updated by the remaining Permittee(s) to meet the requirements of Part 3.4 of the Permit.

PART 5. STANDARD PERMIT CONDITIONS

5.1. Duty to Comply.

5.1.1. The Permittee must comply with all conditions of this Permit. Any Permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

5.1.2. Penalties for Violations of Permit Conditions.

a. Violations. The Act provides that any person who violates the Act, Utah wastewater rules, or conditions of a permit issued under the Act is subject to a fine of $10,000 per day.

b. Willful or Gross Negligence. The Act provides that any person who discharges a pollutant to waters of the State as a result of criminal negligence or who intentionally discharges is criminally liable and is subject to imprisonment and a fine of up to $50,000 per day. Utah Code Ann. § 19-5-115.

c. False Statements. The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act, the rules, or this Permit, or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act shall upon conviction , be punished by a fine of not more than $10,000 or by imprisonment for 6 months, or by both. Utah Code Ann. § 19-5-115(4).

5.2. Dut y to Reapply. If a Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, it must apply for and obtain a new permit except as provided in Part 2.4 of this Permit.

5.3. Need to halt or reduce activity not a defense. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

5.4. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit which has a reasonable likelihood of adversely affecting human health or the environment.

5.5. Duty to Provide Information. The Permittee shall furnish to the Executive Secretary or an authorized representative, within a reasonable time, any information which is requested to determine compliance with this Permit. The Permittee must also furnish to the Executive Secretary or an authorized representative copies of records to be kept by this Permit.

5.6. Other Information. When the Permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Executive Secretary, he or she shall promptly submit such facts or information.

5.7. Oil and Hazardous Substance Liability. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under the "Act".

5.8. Property Rights. The issuance of this Permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

5.9. Severability. The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit shall not be affected thereby.

5.10. Record Retention.

5.10.1. The Permittee shall retain copies of SWPPPs and all reports required by this Permit, and records of all data used to complete the Notice of Intent to be covered by this Permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Executive Secretary at any time.

5.10.2. After final stabilization of the construction site is complete, the SWPPP is no longer required to be maintained on site, but may be maintained by the Permittee(s) at its primary headquarters. Access to the SWPPP will continue as described in Part 3.2, however.

5.11. Addresses. All written correspondence under this permit shall be directed to the Division of Water Quality at the following address:

Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

5.12. State Laws.

5.12.1. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Utah Code Ann. § 19-5-117.

5.12.2. No condition of this Permit shall release the Permittee from any responsibility or requirements under other environmental statutes or regulations.

5.13. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions

of this Permit and with the requirements of SWPPPs. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a Permittee only when necessary to achieve compliance with the conditions of the Permit.

5.14. Inspection and Entry. The Permittee shall allow, upon presentation of credentials, the Executive Secretary or an authorized representative:

5.14.1. To enter upon the Permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this Permit;

5.14.2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this Permit;

5.14.3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

5.14.4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by law, any substances or parameters at any location.

5.15 Reopener Clause.

5.15.1. Reopener Due to Water Quality Impacts. If there is evidence indicating that the storm water discharges authorized by this Permit cause, have the reasonable potential to cause or contribute to, a violation of a water quality standard, the discharger may be required to obtain an individual permit or an alternative general permit in accordance with Part 2.3 of this Permit or the Permit may be modified to include different limitations and/or requirements.

5.15.2. Reopener Guidelines. Permit modification or revocation will be conducted according to UAC R317-8-5.6 and UAC R317-8-6.2.

5.15.3. Permit Actions. This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Permit condition.

5.16. Signatory Requirements.

5.16.1. All Notices of Intent, SWPPPs, reports, certifications or information submitted to the Executive Secretary, or that this Permit requires be maintained by the Permittee, shall be signed as follows:

a. All Notices of Intent shall be signed as follows:

1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign

documents has been assigned or delegated to the manager in accordance with corporate procedures;

2) For a partnership of sole proprietorship: by a general partner or the proprietor, respectively; or

3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. Regional Administrators of EPA).

b. All reports required by the Permit and other information requested by the Executive Secretary or by an authorized representative of the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1) The authorization is made in writing by a person described above and submitted to the Executive Secretary; and

2) The authorization specifies either an individual or a position having responsibility for overall operation of the regulated site, facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

c. Certification. Any person signing documents under this Part 5.16 shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

5.16.2. If a document is to be signed electronically, the Division's rules regarding electronic transactions govern.

PART 6. DEFINITIONS

As used in this Permit:

6.1. "Act" means the "Utah Water Quality Act"

6.2. "Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

6.3. "Common plan of development or sale" means one plan for development or sale, separate parts of which are related by any announcement, piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, plat, blueprint, contract, permit application, zoning request, computer design, etc.), physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.), or continuing obligation (including contracts) that identify the scope of the project. A plan may still be a common plan of development or sale even if it is taking place in separate stages or phases, is planned in combination with other construction activities, or is implemented by different owners or operators.

6.4. "Commencement of Construction" means the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

6.5. "Construction activity" means soil disturbing activities such as clearing, grading, and excavating of land. The term also includes construction support activities.

6.6. "Construction support activities" means construction material and equipment storage and maintenance, concrete or asphalt batch plants, except as provided in Part 1.4.3 of this Permit.

6.7. "Control Measure" refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to waters of the State.

6.8. "CWA" means Clean Water Act or the Federal Water Pollution Control Act.

6.9. "Dedicated portable asphalt plant" means a portable asphalt plant that is located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to.

6.10. "Dedicated portable concrete plant" means a portable concrete plant that is located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

6.11. "Discharge," when used without qualification, means the discharge of a pollutant.

6.12. "EPA" means the United States Environmental Protection Agency.

6.13. "Eligible" means qualified for authorization to discharge storm water under this general permit.

6.14. "Executive Secretary" means Executive Secretary of the Utah Water Quality Board.

6.15. "Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geo-textiles) have been employed. In some parts of the country, background native vegetation will cover less than 100% of the ground (e.g. arid areas). Establishing at least 70% of the natural cover of native vegetation meets the vegetative cover criteria for final stabilization. For example, if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization. For individual lots in residential construction, final stabilization means that either the homebuilder has completed final stabilization as specified above, or the homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and has obligated the homeowner, by contract, to complete the requirements for final stabilization within two years.

6.16. "Indian Country" is defined as in 40 CFR §122.2 to mean:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities within the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

6.17. "Municipal Separate Storm Sewer System" refers to all separate storm sewers that are owned or operated by the United States, a State, city, town, county, district, association, or other public body having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer districts, flood control districts or drainage districts, or similar entity that discharges to waters of the State.

6.18. "NOI" means notice of intent to be covered by this Permit.

6.19. "NOT" means notice of termination.

6.20. "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system,

vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

6.21. "Runoff coefficient" means the fraction of total rainfall that will appear at conveyance as runoff.

6.22. "Site" means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

6.23. "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

6.24. "Storm water discharge associated with industrial activity" is defined in the Utah Administrative Code (UAC) R317-8-3.9(6)(c) & (d) and incorporated here by reference. Most relevant to this Permit is UAC R317-8-3.9(6)(d)10, which relates to construction activity including clearing, grading and excavation activities.

6.25. SWPPP means Storm Water Pollution Prevention Plan, referring to the plan required in Part 3 of this Permit.

6.26. "Total Maximum Daily Load" or "TMDL" means the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

6.27. Waters of the State means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow throw, or border upon this state or any portion thereof, except that bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, shall not be considered to be waters of the state (UAC R317-1-1.31).

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Notice of Intent for Storm Water Discharges

STATE OF UTAH, DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY
195 North 1950 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870 (801)536-4300

NOI Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under the UPDES General Permit No. UTR359185 SEE REVERSE FOR INSTRUCTIONS

Submission of this Notice of Intent constitutes notice that the party(s) identified in Section I of this form intends to be authorized by UPDES General Permit No. UTR359185 issued for storm water discharges associated with construction activity in the State of Utah. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

Is this NOI seeking continuation for previously expired permit coverage at the same site? (Y or N)
If yes, what is the number of the previous permit coverage? Permit No. UTR107469

Permit Registration Date: 12/05/2011 **Permit Start Date:** 12/07/2011 **Permit Expiration Date:** 06/30/2013

I. OPERATOR INFORMATION

Name (Main operator): US Department of Energy **Phone:** 435-719-2800
Address: 1871 North Highway 191 **Status of Owner/Operator:** FEDERAL
City: MOAB **State:** UT **Zip:** 84532
Contact Person: Ed Baker **Phone:** 435-260-6177

Name (1st Co-permittee): EnergySolutions **Phone:** 435-719-2800
Address: 1871 North Highway 191 **Status of Owner/Operator:** PRIVATE
City: MOAB **State:** UT **Zip:** 84532
Contact Person: Ed Baker **Phone:** 435-260-6177

Name (2nd Co-permittee): **Phone:**
Address: **Status of Owner/Operator:**
City: **State:** UT **Zip:**
Contact Person: **Phone:**

Name (3rd Co-permittee): **Phone:**
Address: **Status of Owner/Operator:**
City: **State:** **Zip:**
Contact Person: **Phone:**

Please copy this form if you have more co-permittees than what is allowed on this form.

II. FACILITY SITE / LOCATION INFORMATION

Is the facility located in Indian Country? N (Y or N)

Name: Moab UMTRA Project at Moab Site
Project No. (if any):
Address: 1871 North Highway 191 **County:** GRAND
City: MOAB **State:** UT **Zip:** 84532
Latitude: 38.604722 **Longitude:** -109.5627880
Method (check one): ☐ USGS Topo Map, Scale ☐ EPA Web site ☐ GPS ☒ Other

Attachment 1. Storm Water Permit, Requirements, and Notice of Intent for Storm Water Discharges (continued)

Notice of Intent for Storm Water Discharges (continued)

III. SITE ACIVITY INFORMATION

Municipal Separate Storm Sewer System (MS4) Operator Name: None

Receiving Water Body: Colorado River known

How far to the nearest water body? 0 ft

List the Number of any other UPDES permits at the site: None

IV. TYPE OF CONSTRUCTION (Check all that apply)

1.☐ Residential 2.☐ Commercial 3.☐ Industrial 4.☐ Road 5.☐ Bridge 6.☐ Utility 7.☐ Contouring, Landscaping

8.☒ Other (Please list) The Moab UMTRA Site at Moab is a former uranium ore processing facility. DOE/EnergySolutions is in the process of excavating and ship

V. BEST MANAGEMENT PRACTICES

Identify proposed Best Management Practices (BMPs) to reduce pollutants in storm water discharges: (Check all that apply)

1.☐ Silt Fences 2.☒ Sediment Pond 3.☒ Seeding/Preservation of Vegetation 4.☒ Mulching/Geotextiles 5.☒ Check Dams

6.☒ Structural Controls (Berms, Ditches, etc.)

7.☐ Other (Please list)

VI. ADDITIONAL INFORMATION REQUIRED

Estimated Area to be Disturbed (in Acres): 130 **Total Acreage:** 479

A storm water pollution prevention plan has been prepared for this site and is to the best of my knowledge in Compliance with State and/or Local Sediment and Erosion Plans and Requirements. Y **(Y or N)**
(A pollution prevention plan is required to be on hand before submittal of the NOI.)

Enter the best e-mail address for contacting the permittee: ed.baker@gjemrac.doe.gov

VII. CERTIFICATION: I certify under penalty of law that I have read and understand the *Part 1* eligibility requirements for coverage under the general permit for storm water discharges from construction activities. I further certify that to the best of my knowledge, all discharges and BMPs that have been scheduled and detailed in a pollution prevention plan will satisfy requirements of *Part 1*, and *Part 3* of this permit. I understand that continued coverage under this storm water general permit is contingent upon maintaining eligibility as provided for in *Part 1*.

I also certify under penalty of law that this document and all attachments were prepared under the direction or supervision of those who have placed their signature below, in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name (of responsible person for the main operator from first page): Ed Baker **Date:**

US Department of Energy 12/05/2011

Signature: Ed Baker

Print Name (of responsible person for the 1st co-permittee from first page): Ed Baker **Date:**

EnergySolutions 12/05/2011

Signature: Ed Baker

Print Name (of responsible person for the 2nd co-permittee from first page): **Date:**

Signature:

Print Name (of responsible person for the 3rd co-permittee from first page): **Date:**

Signature:

Amount of Permit Fee Enclosed: $ 220.00

Attachment 2.
Storm Water, Erosion Control, and BMP Inspection Forms

Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms

Table 2−1. Maintenance and Inspection Requirements

BMP Name	Recommended Maintenance/Repair	Inspection Requirements
Source Control BMPs:		
Buffer zones	Inspect areas at limits of construction to ensure flagging is still in proper location and area remains undisturbed. Disturbed areas must be stabilized.	Informal; report surface disturbances outside designated construction zones immediately.
Covered loads	Tarp all trucks hauling materials on or off site.	Informal; all loads prior to hauling must be covered.
Dust control	Re-apply dust-control measures as necessary to keep dust to a minimum at all times.	Informal; more frequent inspection is required during dry weather.
Erosion control materials	Maintain specified mulch cover. Correct eroded areas and re-apply erosion-control materials as necessary. Replace damaged materials and correct drainage problems.	Monthly inspections by environmental personnel and after storm events when storm water flows.
Preserving natural vegetation	Inspect flagged areas to ensure flagging is still in proper location and area remains undisturbed. Disturbed areas must be stabilized.	Informal; report disturbance to natural vegetation immediately.
Seeding/revegetation	Reseed areas that fail to germinate. Correct eroded areas by regrading, reseeding, and installing erosion-control materials, as necessary.	Inspect monthly during growing season until cover is considered finally stabilized (vegetation density of 70 percent pre-disturbance levels) and after storm events.
Soil stabilizers/surfactants	Apply only according to manufacturer directions. Re-apply as required.	Biweekly and after storm events in which surface water flows. Monthly if no rainfall has occurred.
Soil stockpiles	Inspect regularly and stabilize areas that have eroded.	Informal and after storm events in which surface water flows.

Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms (continued)

Table 2−1. Maintenance and Inspection Requirements (continued)

BMP Name	Recommended Maintenance/Repair	Inspection Requirements
Source Control BMPs (continued):		
Stabilized construction entrance	Restrict vehicle access to stabilized entrance. Upgrade if rock entrance is not working to prevent off-site tracking.	Informal
Surface roughening	Regrade any areas beginning to erode. Restrict vehicle access. Seed designated areas as soon as possible without smoothing surface.	Biweekly and after storm events in which surface water flows. Monthly if no rainfall has occurred.
Erosion wattles	Inspect regularly and replace or restake as needed. Remove sediment when it is half the height of the wattle.	Inspect monthly and after storm events in which surface water flows.
Soil covering	To be used as an emergency cover for actively eroding areas such as soil stockpiles. Dispose of plastic properly when no longer needed.	As needed.
Debris cleanup	Remove all litter and construction debris daily from the work area.	Informal.

Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms (continued)

Table 2−1. Maintenance and Inspection Requirements (continued)

BMP Name	Recommended Maintenance/Repair	Inspection Requirements
Runoff, Conveyance, and Treatment BMPs		
Sediment basin	Sediment must be removed from the sediment basin/pond when the design capacity has been reduced by 50 percent.	Biweekly and after storm events in which surface water flows. Monthly if no rainfall has occurred.
Dispersion apron	Inspect to ensure underlying soils are not eroding. Remove sediment and repair eroded areas.	Inspect only if damage or sedimentation has occurred in adjacent diversion channel.
Silt fence	Repair damaged fencing immediately. Intercept concentrated flows and re-route. Remove sediment accumulations at 6 inches. Replace deteriorated fencing materials. Remove silt fence when upstream disturbed areas are stabilized. Properly dispose of used fencing.	Informal daily; formal bi-weekly and after storm events in which surface water flows. Monthly if no rainfall has occurred.
Straw/rock wattles barrier	Check for undercutting, end runs, and damaged wattles. Remove accumulated sediment when it is half the barrier height. Replace with check dams if straw wattles prove to be inefficient.	Biweekly and after storm events in which surface water flows. Monthly if no rainfall has occurred.
Diversion channel	Inspect to ensure structural integrity. Repair as needed. Remove sediment if present.	Biweekly and after storm events in which surface water flows. Monthly if no rainfall has occurred.
Road cleaning	Inspect road surface for transported sediment. Shovel or sweep sediment and dispose of properly.	Informal.

Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms (continued)

Moab Site Routine Erosion and Sediment Control Inspection Form

Inspector(s)_____ Date_____

BMP Designation	OK	Not OK	BMP Condition, Corrective Actions, Notes
US-191 Project			
Culverts (BMP 2)			
Culverts US191			
Culverts Hillside			
Culverts SR-79			
Culverts On Site			
Basins (BMP 5)			
Basin 2			
Basin 3			
Rip Rap (BMP 4)			
Rip Rap 1			
Rip Rap 2			
Rip Rap 3			
Rip Rap 4			
Erosion Matting (BMP 3)			
Erosion Matting 1			
Erosion Matting 2			
Erosion Matting 3			
Erosion Matting 4			
Erosion Logs (BMP 3)			
Erosion Log 1			
Erosion Log 2			
Erosion Log 3			
Hillside			
Rock Wattles (BMP 3)			
Uphill Haul Road			
Downhill Haul Road			
Erosion Logs (BMP 3)			
SR-279			
Lower Haul Road			
Runaway Truck Ramp			
Culverts (BMP 2)			
South End Railroad Spur			
North End Railroad Spur			
North of Underpass			

Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms (continued)

Moab Site Routine Erosion and Sediment Control Inspection Form (continued)

BMP Designation	OK	Not OK	BMP Condition, Corrective Actions, Notes
Drainage Ditches (BMP 1)			
Uphill Haul Road			
Downhill Haul Road			
Runaway Truck Ramp			
Hillside Southwest of Truck Ramp			
Blanket West of Truck Ramp			
Queue Area			
Culvert (BMP 2)			
On Haul Road			
Rip Rap (BMP 4)			
North of Building			
Erosion Matting/Straw Wattles (BMP 3)			
North of Building			
Drainage Ditches (BMP 1)			
North Side of Building			
South Side of Building			
Moab Wash Perimeter			
Rip Rap (BMP 4)			
Along Access Road 1			
Along Access Road 2			
Slopes North Middle Crossing			
Erosion Matting/Straw Wattles (BMP 3)			
All Side Slopes			
Upper Crossing (BMP 1)			
Native Rock Surface			
Level with Stream Bed			
No Foreign Material			
Underpass			
Drainage Ditches (BMP 1)			
East Drainage			
West Drainage			
Energy Dispersion (BMP 4)			
Lower Haul Road			
Culverts (BMP 2)			
East Culvert			
West Culvert			

Attachment 2. Storm Water, Erosion Control, and BMP Inspection Forms (continued)

Moab Site Routine Erosion and Sediment Control Inspection Form (continued)

BMP Designation	OK	Not OK	BMP Condition, Corrective Actions, Notes
Tailings Pile			
Drainage Ditches (BMP 1)			
West Side			
East Side			
North Side			
Berms/Containment Dikes (BMP 6)			
South			
East			
Decon and/or Erosion Basin (BMP 5)			
North End			
Dike Along Colorado River (BMP 6)			
Northeast of Moab Wash			
Southwest of Moab Wash			
Administration Area (BMP 1)			
Rip Rap South Side			
Parking Lot Drainage East			
Catch Basin East			

I,_____, certify that the results of this inspection show that the Moab site is in compliance with the Moab Site SWP3 and this permit.

Conduct routine inspections of disturbed areas at least once every 14 days and before anticipated storm events. Any required maintenance must be reported to the Moab Operations Manager within.

Attachment 3.
Examples of Best Management Practices

Attachment 3. Examples of Best Management Practices

Examples of Erosion and Sediment Control Measures

The provided examples may include specific application rates or references to species lists that were appropriate to the sites or states for which the originating document was developed. However, prior to application or selection of species for revegetation at the Moab site, application rates or species identification would need to be adjusted based on area conditions and elevation.

These measures were obtained from two of many sources available on the Internet. The list below identifies the source as either CDOT, referencing the Colorado Department of Transportation, or, NV, for the State of Nevada Storm Water website. The Nevada examples are also identified by a footnote that refers to the Truckee Meadows Regional Storm Water Quality Management Program.

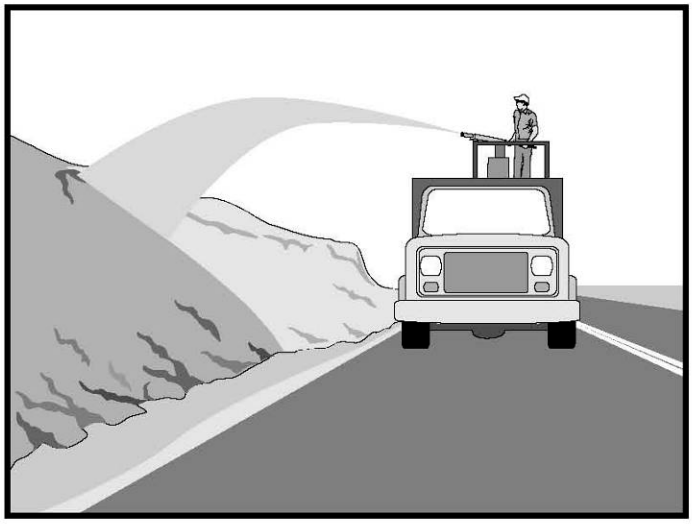
The Colorado Department of Transportation, Erosion Control and Storm Water Quality Guide is available at: http://www.dot.state.co.is/environmental/envWaterQual/wqms4asp.

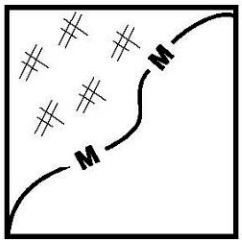
The *Truckee Meadows Construction Site Best Management Practices Handbook*, by Kennedy/Jenks Consultants, February 2003, is a comprehensive resource for information on erosion and sediment control methods that is used by the State of Nevada and may be found on the Nevada State Storm Water website,
http://www.cityofreno.com/gov/pub_works/stormwater/pdfs/TruckeeMeadowsBMP_rev01.pdf

The following is a listing of the measures provided in this appendix.

Mulching (NV)
Mulch Tackifier (CDOT)
Soil Binders (NV)
Turf Reinforcement Mats (CDOT)
Erosion Control Blankets (CDOT)
Rolled Erosion Control Products (NV)
Erosion Logs (CDOT)
Erosion Bales (CDOT)
Wind Erosion Control (CDOT)
Riprap (NV)
Revegetation (NV)
Check Dams (NV)
Permanent Diversions (NV)
Storm Water Outlet Protection (NV)

MULCHING EC-3





MAP SYMBOL

Graphics used with permission of Caltrans

Purpose: To prevent erosion by protecting bare soil from rainfall, reducing runoff velocity, conserving moisture, and fostering plant growth. Mulches can be composed of organic materials, straw, wood chips, bark or other wood fibers, gravels, a variety of netting, or chemical stabilizers and they act to protect seeds from predators while reducing evaporation and insulating the soil.

Application:

- Applicable to all bare soil surfaces where construction activities will cease for 14 days or more and will not resume within 21 days.
- Provides a temporary cover and aids in stabilization measures.
- Mulching should immediately follow temporary and permanent seeding of an area.

Limitations:

- Additional control measures are necessary for the establishment of vegetation if the area is susceptible to erosion.
- Straw and wood mulch may have to be removed before soil stabilization or permanent seeding is to take place.
- Straw and wood mulch are prone to removal by runoff and wind.
- Wood fiber hydraulic mulches usually last only part of a growing season.
- A potential for introducing weed-seed and unwanted plant material exists.

MULCHING EC-3

- The use of grasses may cause a fire hazard and require regular maintenance.
- Not all soil conditions are appropriate.

Standards and Specifications:

- The type of mulch to be applied depends on soil type, site conditions, landscape requirements, and economics.
- Embankments and fill areas should be roughened before applying mulch.

Straw Mulch

- Used as a temporary or permanent surface cover on disturbed areas until vegetation can be established.
- Straw should be applied at a minimum rate of 4,000 lb/acre.
- Straw mulch can be applied to a slope by crimping, punch roller-type rollers, or track-walking.
- The area must be within 150 feet of a roadway if straw blowers are to be used in the application of the mulch,
- Do not place straw in lined drainage channels, on sidewalks, or on sound walls.
- Straw should be held into place on steep slopes or in small areas by plastic netting or jute.
- Apply straw mulch at a rate of 125 lb/acre if tackifier is to be used.
- Ensure that the mulch is weed free.

Wood Mulch and Shredded Wood

- Primarily used as a temporary ground cover around trees, shrubs, and landscaping.
- Is applicable as a covering for ornamental or revegetated plantings.
- Should be applied by hand.
- Distribute mulch as a layer 2-3 inches thick.

Green Material/Compost

- Mulch should be composted to kill weed seeds.
- Apply mulch evenly to a maximum thickness of 2 inches.
- Typically applied by hand.

MULCHING EC-3

Hydraulic Mulches made from recycled paper

- Composed of a mixture of recycled newsprint, magazines, or other paper waste products.
- Mulch should be mixed with seeds, fertilizer, and tackifier and can be applied on most sites.
- Erosion control effectiveness is limited by the short fiber length and lack of tackifier.
- Life span is less than that of the wood fiber mulches.

Hydraulic Mulches made from wood fiber

- Industry standard is composed of whole wood chips. Wood fiber mulch can also be made from lumber mill waste.
- Good for planting large areas quickly and economically.
- Provides limited erosion control (even with tackifier) when applied at high rates.
- Offers better wet-dry characteristics than paper mulch.

Hydraulic matrices (Bonded Fiber Matrix)

- Hydraulic slurries are a mix of wood or cellulose fiber held together by a chemical or mechanical bond.
- This mixture does not dissolve upon rewetting or contain any growth inhibiting factors.
- Application rates should range between 3,000 lbs/acre to 4,000 lbs/acre.
- Do not apply immediately before, during, or after rainfall. Allow 24 hours of drying before application.
- All mulch materials must be removed before working on the slopes.
- Weak spots should be covered to prevent soil erosion and to protect the soils.

Inspection and Maintenance:

- Inspect for failures and loss of mulch during the wet season.
- Replace lost mulch immediately.

EC 3: Mulch Tackifier

Description

An organic soluble powder adhesive used in the form of a water slurry to adhere native hay, straw, hydromulch, or seed to a surface and together. Derivative of plant material phyllium or Guar.

Applications

- Used in combination with a native forage material for mulching applications.
- Used in combination with seed to adhere seed to soil.
- Used to adhere wood cellulose material (hydro mulch) to surface.
- Used to cover disturbances as temporary cover for wind erosion.

Limitations

- Temporary measure to hold mulch material until native seeding is established.
- Product is water-soluble and must be reapplied 6-12 months after initial application if plants have not stabilized soils.
- Do not apply during precipitation event or over snow.
- Do not apply where in areas of concentrated flow.

Design Guidelines

Design mixture as shown or as recommended by the manufacturer:

- 150-200 lbs of organic mulch tackifier per acre.
- 1,000 gallons of water per acre.
- 350 lbs of wood cellulose material per acre.

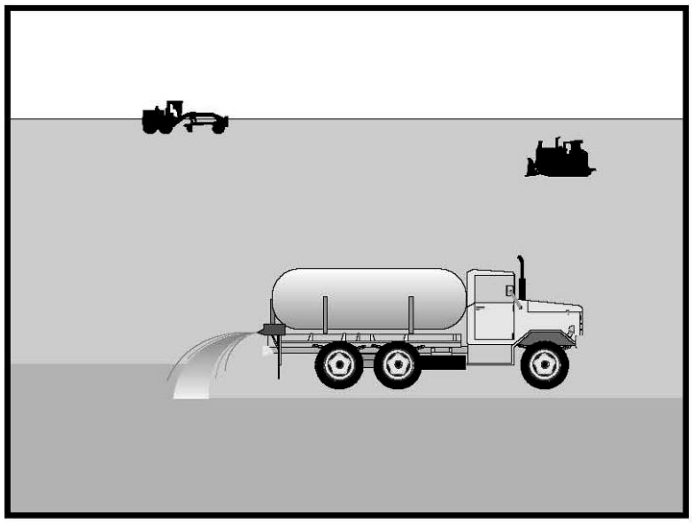
Installation

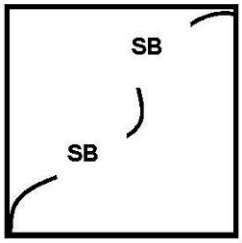
- Apply within 4 hours of mulch application.
- Always apply in a liquid state.
- Can be applied in combination with organic fertilizers and humates.

Maintenance and Inspection

- Mulch movement indicates poor application and product mixture.
- Proper application will bond mulch material together and to soil.
- Inspect by touching mulch surface to determine if adhesion has occurred.

SOIL BINDERS EC-4





MAP SYMBOL

Graphics used with permission of Caltrans

Purpose: To provide temporary stabilization of disturbed soils.

Application:

- Locations where other methods such as temporary or permanent seeding of vegetation can't be applied.
- Used in combination with vegetative or perimeter practices to enhance erosion and sediment control.

Limitations:

- May limit infiltration and increase runoff.
- Overuse may adversely impact water quality.
- Chemical stabilizers are expensive compared to vegetative practices.
- Soil binders are only temporary and therefore need to be reapplied.
- Some binders need at least 24 hours to become fully effective.
- Heavy rainfall events may cause spot failures.
- Soil binders are weakened by pedestrian or construction traffic.
- Soil surfaces comprised of compacted silts and clays may be impenetrable to soil binders.
- Low temperatures may not allow soil binders to cure.
- Some soil binders do not perform well in climates with low relative humidity.

SOIL BINDERS EC-4

Standards and Specifications:

- Soil binders must be non-toxic to plants and animals, easy to apply, easy to maintain, economical, and should not stain paved surfaces.
- Spray should not reach sidewalks, lined drainage channels, or existing vegetation.

Types of soil binders:

- Copolymer – Provides long-term soil stabilization (1-2 years) and is compatible with existing vegetation. However, it is relatively costly and 80 – 100 gallons/acre is the suggested application rate.
- Lignin sulfonate – Good for short- to medium-term soil stabilization in low traffic areas. Effective in dry climates and should be applied in a 1-2 inch thick layer on loosened surfaces.
- Psyllium/Guar – Good for short-term application. They are low cost but may adversely affect vegetation.
- Starch, Rosin and Bonded Fiber Matrix (EC-3) can also be used.

Factors to consider when choosing a soil binder:

- Consider where the soil binder will be applied.
- Soil type and frequency of application.
- Follow the manufacturer's recommended application rates and procedures.
- Roughen embankments and fill areas prior to application of soil binders.
- Do not apply soil binders during or immediately after rainfall.
- Do not apply soil binders to frozen soils or areas with standing water or during rainy conditions or when the temperature is less than 40°F.
- Allow 24 hours for soil binders to cure.

The application of liquid agents requires:

- Pre-wetting of the ground surface.
- Overlapping solution 6 to 12 inches.
- Curing for a minimum of 24 hours.
- Apply a second treatment when first treatment becomes 50 percent ineffective.
- Re-wetting the chemicals with water to reactivate them in dry climates.

SOIL BINDERS EC-4

Inspection and Maintenance:

- Inspect regularly areas that have been chemically stabilized.
- Inspect daily high traffic areas while lower trafficked areas need only weekly inspection.
- Reapply stabilizers if needed.

EC 6: Turf Reinforcement Mats (TRM)

Description

A rolled permanent erosion control product composed of UV-stabilized, non-degradable, synthetic materials (which may include an organic, biodegradable fiber component) processed into a three-dimensional matrix.

Applications

- Used in ditches, swales, channels, and slopes where design discharges exert velocities and shear stresses that exceed the limits of mature, natural vegetation to prevent erosion.
- Used in transition areas before and after hard armor (i.e., riprap, concrete, asphalt etc.) to provide for stable and non-erosive transition.

Limitations

- In an unvegetated state, velocities should not exceed 14 ft/sec maximum or the limitations provided by the manufacturer.
- In a vegetated state, velocities should not exceed 25 ft/sec maximum or the limitations provided by the manufacturer.
- Maximum slope is dictated by the soil stability and above referenced limited velocity and shear stress limitations.
- Soils must be conducive to the establishment of vegetation.

Design Guidelines

- TRM may be installed as either an on-the-surface or soil-loaded system (for surface, see Figure EC 5.1; for soil-loaded, see Figure EC 5.2).
- TRM shall be unrolled in direction of flow with edges overlapped a minimum of 4 inches and end of rolls overlapped a minimum of 6 inches.
- Anchors for the TRM should be per manufacturer's recommendations for the particular TRM application and no less than two per square yard.

Attachment 3. Examples of Best Management Practices (continued)

- TRM shall extend 2 feet minimum above the design maximum flow line in ditches, swales, and channels.
- Unless the TRM is anchored by a hard armor application, the leading edge of the TRM shall be buried and anchored per Figure EC 5.3.
- Soil-loaded system shall have no more than 1.5 to 2 inches of soil applied on the TRM.

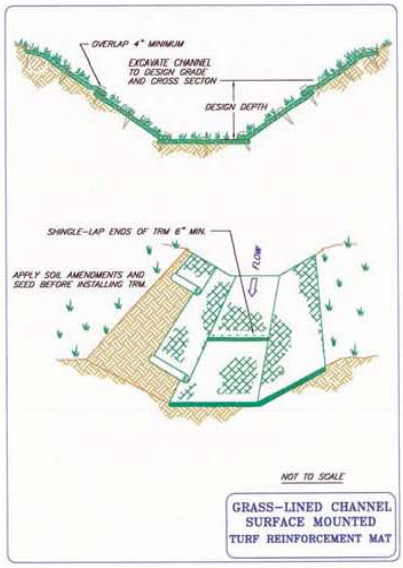


FIGURE EC 6.1
TRM in Ditch Application (CDOT[18])

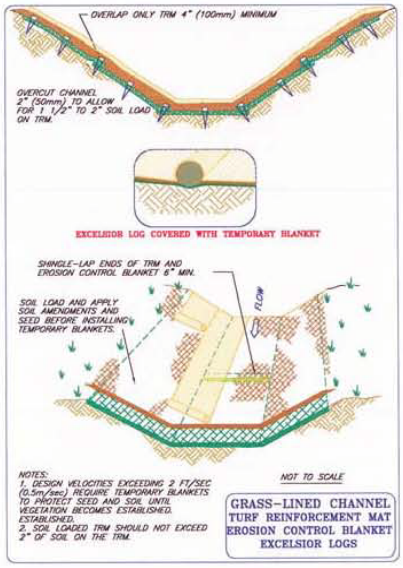


FIGURE EC 6.2
TRM in Ditch Application with Mesh/Burlap Socks (CDOT[18])

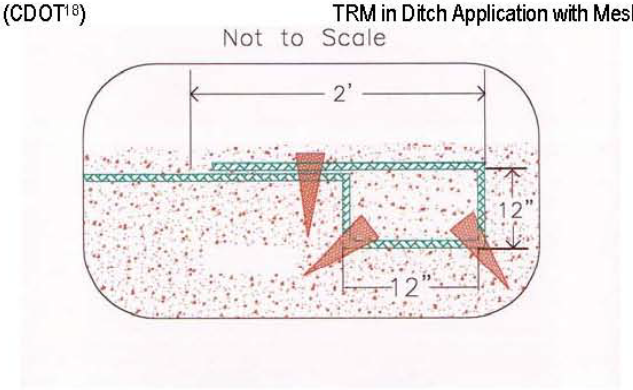


FIGURE EC 6.3
Trenching of TRM (CDOT[18])

Attachment 3. Examples of Best Management Practices (continued)

Installation

- All vegetation, roots, rocks, and other objectionable material shall be removed and disposed of so as not to create loss of soil contact by the TRM when installed.
- If TRM is not soil loaded, apply seed, soil amendments, etc. before installing TRM.
- If the TRM is soil loaded, follow installation of the TRM with seed and soil amendments. After soil loading the TRM, install an erosion control blanket as shown in Figure EC 6.2. Install the erosion control blankets in accordance with the manufacturers recommendation. General guidelines are included in BMP EC 5: Erosion Control Blankets.
- If mesh/burlap socks are used in conjunction with the soil-loaded system, they should be placed before the erosion control blanket and after soil loading. The erosion control blankets should be unrolled and closely stapled to the upper edge of the mesh/burlap sock; unrolled tightly over the mesh/burlap sock and stapled closely at the lower edge; and then continuously unrolled (see Figure EC 6.3).

Maintenance and Inspection

- Re-anchor loosened matting and replace missing matting and staples as required.
- Inspection shall be performed periodically especially after a storm event that results in runoff, and any required repairs or maintenance shall be executed immediately.

EC 5: Erosion Control Blankets

Description Organic or synthetic blankets installed on steep lopes or channels to prevent erosion until final vegetation is established.

Applications

- Used to control erosion and promote the establishment of vegetation.
- Used to protect channels against erosion from concentrated runoff. Also refer to EC 6, Turf Reinforcement Mats, for additional types of erosion protection for areas with concentrated runoff.
- Used as a temporary feature.

Attachment 3. Examples of Best Management Practices (continued)

Limitations

- Blankets used on slopes should be biodegradable, or photodegradable, non-toxic to vegetation or germination of seed, and non-toxic or injurious to humans.
- Do not use on slopes where vegetation is already established.
- Use on slopes 2:1 or steeper. Also use in locations with 3:1 slopes facing south or west. Product must be reapplied 6-12 months after initial application. If used in conjunction with seeding, reapply every 6-12 months until vegetation is established.

Design Guidelines

- For slope applications, selection of the appropriate material will depend on the amount of runoff, steepness of the slope, flow velocities, cost, ease of installation, type of soils, shear stress, and past experience.
- For channel applications, selection will be based mainly on shear stress. Refer to EC 6 for additional selections.
- Table EC 5.1 indicates dome recommended criteria for the selection of erosion control blankets.

TABLE EC 5.1
Seeding Season

Condition	Blanket Type
Slopes 2:1 or Steeper	Straw Blanket Straw/coconut blanket Synthetic Blanket Wood Fiber Blanket (excelsior)
Erosive soil (sand) or slopes receiving sheet flow from roadway surface runoff	Straw Blanket Straw/coconut blanket Synthetic blanket

Materials

- Combination Blankets: Consists of a photodegradable plastic netting which covers, and is entwined, in a natural organic or man-made mulching material. The mulching material can be wood-fiber, excelsior, straw, coconut fiber, manmade fiber, or a combination of the same. Some existing combinations are 100% coconut fiber, or 70% agricultural straw and 30% coconut fiber, or 100% agricultural straw.
- Jute mesh: Consists of a mat lining woven of undyed and unbleached jute yarn. Varies from 1/8″ to ¼″ in diameter. The mat weighs approximately 0.80 lbs per square yard, with openings about 3/8″ by ¾″. It can be used with or without straw underlay.
- Soil reinforcement mats: Formed by three-dimensional structures of entangled nylon monofilaments, melt-bonded at their intersections. These mats must be capable of maintaining its shape, and are generally highly resistant to environmental and ultraviolet degradation.

Attachment 3. Examples of Best Management Practices (continued)

Installation

- Areas where the blanket is to be used shall be properly prepared, fertilized, and seeded before the blanket is placed.
- Installation of the blankets shall be in accordance with the manufacturer's recommendations.
- The blanket shall be placed smoothly but loosely on the soil surface without stretching.
- Pins and staples shall be made of wire 0.162 inch or larger in diameter. "U" shaped staples shall have legs 8" long, and a 1" crown. "T" shaped pins shall have a minimum length of 8". The bar of the "T" shall be at least 4" long. Triangular survey stakes can also be used (see Figure 5.1).
- Staples shall be inserted in a pattern according to the manufacturer's recommendation.
- The upslope end of the blanket shall be buried in a trench 6" by 6" deep beyond the crest of the slope to avoid undercutting (see Figure EC 5.2).
- For slope applications, there shall be at least a 6" overlap wherever one roll of blanket ends and another begins, with the uphill blanket placed on top of the downhill blanket (see Figure EC 5.2).
- There shall be at least a 4" overlap wherever two widths of blanket are applied side by side (see Figure EC 5.2).
- In channels, the blanket shall be buried at terminal ends and every 35' in a trench 6" deep by 6" wide. Before backfilling, staples shall be placed across the width of the trench spaced at 6" on center in a zigzag pattern. The trench shall then be backfilled to grade and compacted by foot tamping.

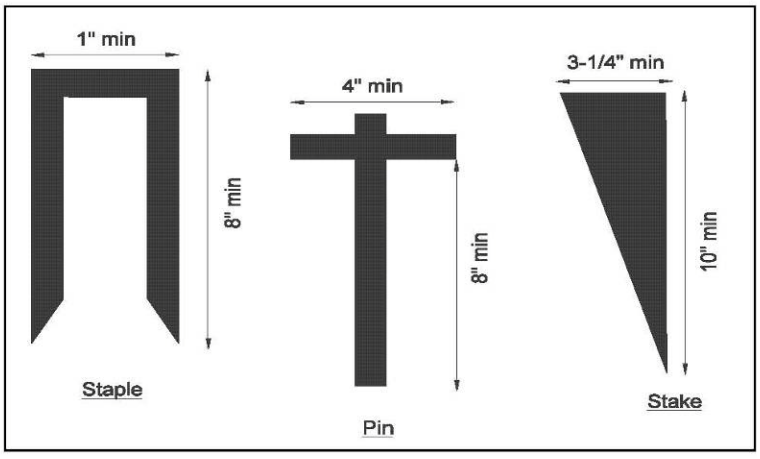


FIGURE EC 5.1
Erosion Control Blanket Anchors

Attachment 3. Examples of Best Management Practices (continued)

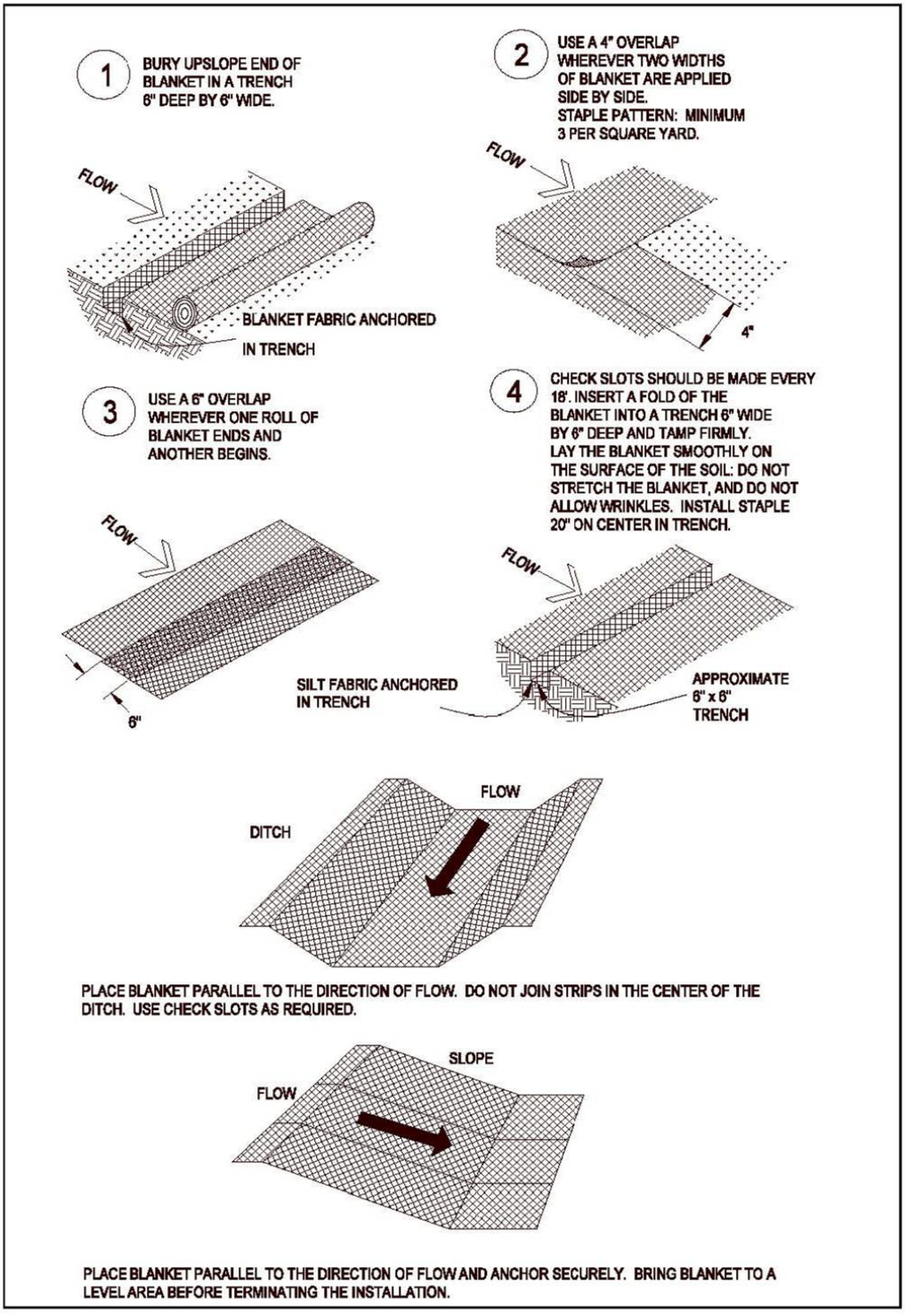


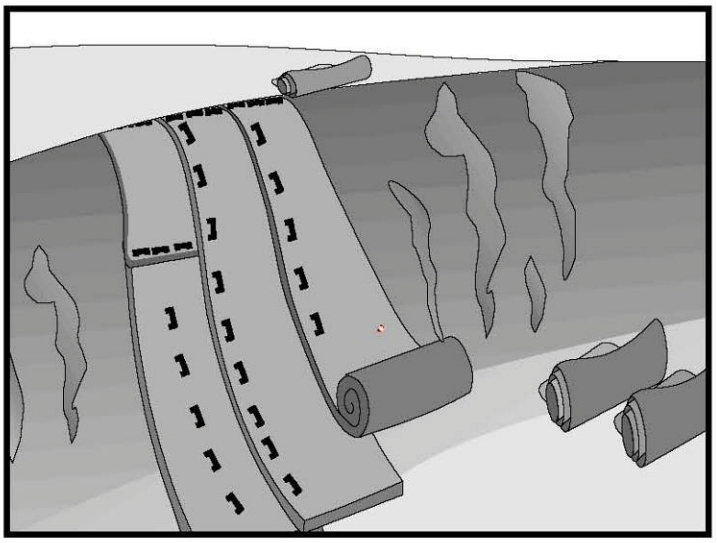
FIGURE EC 5.2
Erosion Control Blanket Installation

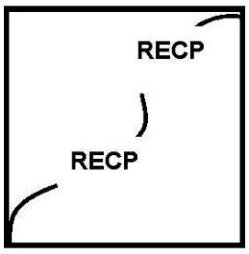
Attachment 3. Examples of Best Management Practices (continued)

Maintenance and Inspection

- Re-anchor loosened matting and replace missing matting and staples as required.
- Inspection shall be performed periodically especially after a storm event that results in runoff, and any required repairs or maintenance shall be executed immediately.

ROLLED EROSION CONTROL PRODUCTS EC-6





MAP SYMBOL

Graphics used with permission of Caltrans

Purpose: To protect soils from wind and water and to stabilize disturbed soil areas through the application of geotextiles, plastic covers, erosion control blankets, cellular confinement systems or turf reinforcement mats.

Application:

- Effective on steep slopes (3H:1V or greater) with high erosion potentials, slopes that are adjacent to streams or wetlands, on disturbed soils that are slow to establish vegetative cover, and on slopes where mulch must be anchored. Can also be applied in stream channels where flow velocities exceed 3.3 ft/sec.

Limitations:

- RECPs are not appropriate for sites that will be mowed or that contain rocky surfaces.
- Erosion control blankets and geotextiles are rarely used as a temporary control measure.
- Erosion control blankets and geotextiles tend to be more expensive than other erosion control methods due labor costs and material expenses.
- Erosion control blankets and geotextiles should not be used in high wind areas.
- Turf reinforcement mats (TRMs) should only be used with irrigation or where there is surface hydrology (i.e. wetlands).

ROLLED EROSION CONTROL PRODUCTS EC-6

- Plastic sheeting is not degradable, can be easily torn, and must be disposed of at a landfill. It also results in 100 percent runoff, which increases the potential for erosion and downstream flooding.

Standards and Specifications:

- Factors to consider when choosing an erosion control blanket include cost, effectiveness, acceptability, vegetation enhancement, installation, and operation and maintenance.
- Geotextiles should have a minimum thickness of 0.6 inches and a minimum width of 12 feet. They should be secured in place with wire staples or sandbags.
- Polyethylene sheeting of 6-mil minimum thickness should be anchored by sandbags placed a maximum distance of 10 feet apart. Seams should be held down by tape or weights across their entire length. All seams should be overlapped at least 12-24 inches.
- Turf reinforcement mats are a three dimensional matrix of interwoven layers of polypropylene, nylon, and polyvinyl chloride netting. They allow for soil filling and retention as well as aiding in the enhancement of vegetative root and stem development.
- Turf reinforcement mats have high shear strengths, are resistant to ultraviolet light, and are inert to the chemicals in soils.
- Straw, coconut, straw/coconut, or Excelsior blankets are used as erosion control mats.
- All rocks, vegetation, clods, and debris should be removed from the site before installing erosion control mats to allow for direct contact with soil.
- Seed the area before installing erosion control blankets.
- To anchor mats, u-shaped wire staples, triangular wooden stakes, or metal geotextile stake pins can be used.
- Staples should be made of steel wire. Wire staples should be a minimum of 11 gauge.
- Metal stake pins should have steel washers at the head of the pins.
- All anchors should be 6-18 inches long.

<u>Steps to install erosion control blankets on slopes:</u>

- At the top of the slope, install a trench 6 inches deep by 6 inches wide to anchor the blanket and then backfill the trench.
- Follow the direction of water and unroll the blanket (downslope).
- Parallel rolls should be overlapped by 2 inches and stapled every 3 feet.

ROLLED EROSION CONTROL PRODUCTS EC-6

- Splice the blankets by laying them over each other with a 6-inch overlap.
- Keep the blankets in direct contact with the soil. Do not stretch them.

To anchor the blanket, install staples:

- Steep slopes (2H:1V and steeper) – minimum of 2 staples/yd^2
- Moderate slopes (2H:1V and flatter) – 1½ staples/yd^2
- Gentle slopes require a minimum of 1 staple/yd^2

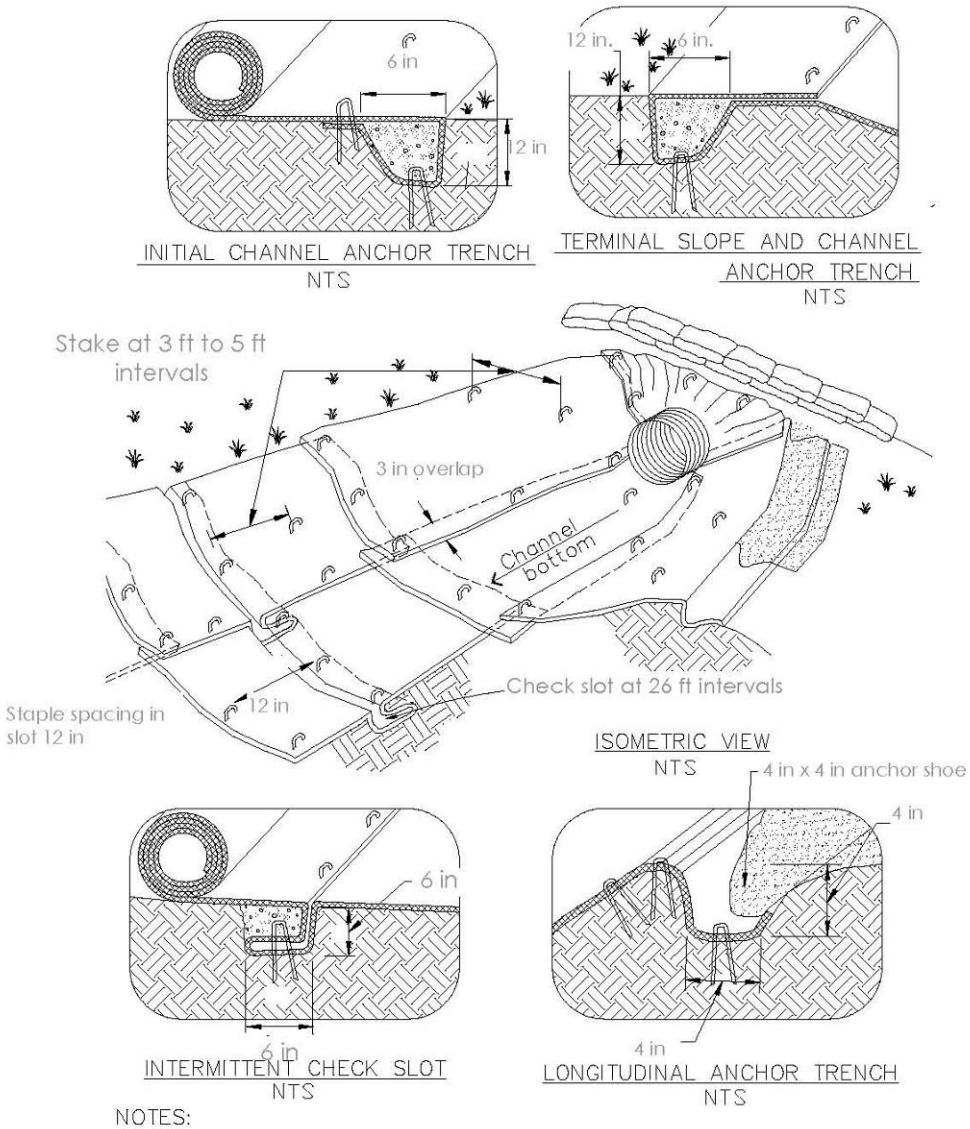
Steps to install erosion control blankets in channels:

- Anchor trench should be 12 inches deep and 6 inches wide across the channel at the lower end of the project area.
- Dig 6-inch deep and 6-inch wide intermittent check slots across the channel at a spacing of 25 to 30 feet.
- To bury the edge of the matting, dig 4-inch deep and 4-inch wide anchor slots longitudinally along the channel.
- Place the initial roll in the center of the channel at the downstream end. Secure it every 12 inches. Note that the matting will be upside down initially.
- Repeat the previous step using the adjacent rolls and creating a 3-inch overlap of blankets. Be sure to anchor the ends of the mats down securely every 12 inches.
- Unroll the center mat upstream and follow with the others maintaining the 3-inch overlap.
- Secure all rolls snugly into transverse check slots by laying the mat into the slot, folding the mat back on itself, installing anchors, filling with backfill and compacting the soil.

Inspection and Maintenance:

- Blankets should be inspected after installation and periodically during construction activities.
- Before and after significant storm events, the blankets and mats should be inspected for erosion and undermining.
- Repair damages and failures immediately.
- Repair the slope or channel before reinstalling blankets if washouts or breakages have occurred.

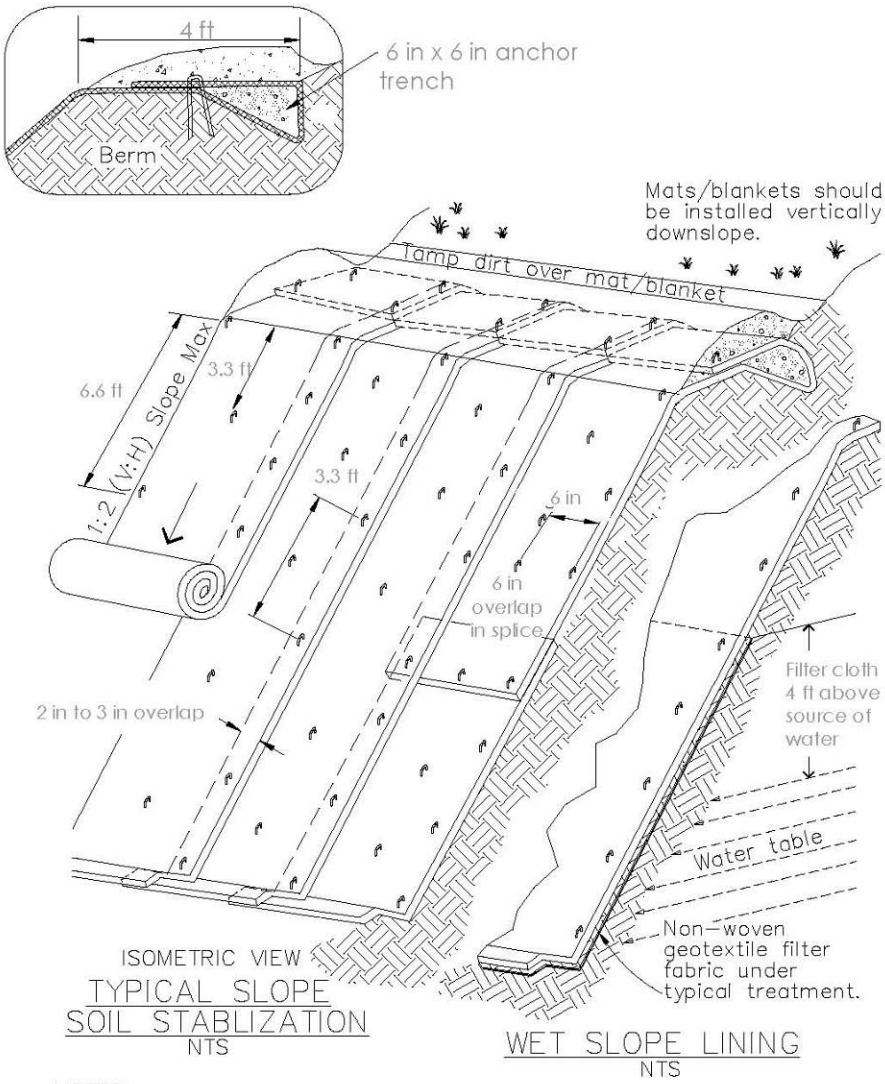
ROLLED EROSION CONTROL PRODUCTS EC-6



NOTES:
1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

Graphics used with permission of Caltrans.

ROLLED EROSION CONTROL PRODUCTS EC-6



NOTES:

1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

Graphics used with permission of Caltrans.

SC 2: Erosion Logs

Description

Erosion logs filled with rock or other filter material used for erosion and sediment control.

Applications

- Used upstream of curb inlets to filter sediment laden runoff. Logs of various length can be accommodated with multiple logs installed in series. Typical placement of a log is upstream of an inlet, in the gutter flow line, and also at the entrance of an inlet.
- Used as check dams in ditches and swales for erosion control until vegetative cover is established.
- Used as a temporary feature.

Limitations

- Logs are manufactured BMPs. Refer to the manufacturer for guidelines on limitations.
- Do not use in ditches and swales with continuous flow.

Material

- Several types of logs exist. A "gravel" log is typically a cylindrical shaped filter with ¼ inch mesh or burlap filter cover filled with ¾ inch gravel. Refer to the manufacturer for specific material specifications.

Installation

General installation guidelines are provided, however, refer to the manufacturer for specific installation requirements.

Attachment 3. Examples of Best Management Practices (continued)

Installation for Check Dam Applications

- When using as a check dam, it should be placed in straight sections to minimize the potential for erosion in the channel bend.

Installation for Curb Inlet Protection (Upstream of inlet)

- Logs will be used upgradient of inlet perpendicular to and flush with the curb.
- The maximum height of the curb log should be less than the top of the curb opening. This is to allow overflows to occur during large rainfall events even though sediment-laden runoff will enter the storm drainage system.
- No less than two 10-inch diameter logs must be used in sequence, spaced no more than five feet apart, upgradient of inlet. No less than six logs shall be used if the 4–inch log is chosen.
- Incline at 30 degrees from perpendicular, opposite the direction of flow.

Installation for Curb Inlet Protection (Entrance of inlet)

- Identify curb opening dimensions to determine how many logs are required.
- Place the log(s) end-to-end along the curb inlet opening.
- Angle the ends of the log(s) towards the curb inlet opening.

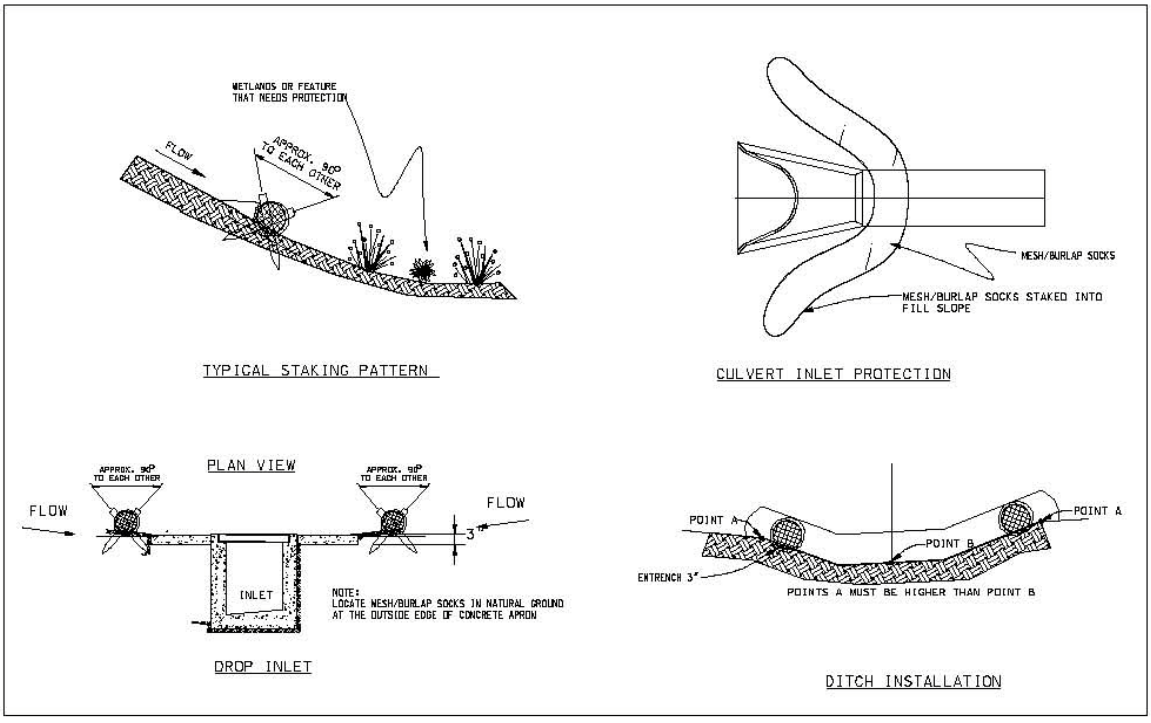


FIGURE SC 2.1
Applications for Erosion Logs (CDOT[18])

Attachment 3. Examples of Best Management Practices (continued)

Maintenance and Inspection

- Inspect logs daily for cuts, abrasions, and proper installation, replace or reposition daily. Remove sediment and dispose in a proper manner.
- Discontinue use if logs create a traffic hazard.

SC 1: Erosion Bale

Description A temporary sediment barrier consisting of a row of entrenched and anchored straw, or hay bales.

Applications

- Used as temporary sediment barriers and filters along the toe of fills or around inlets.

Limitations

- Do not use along toe of fills where the size of the drainage area is greater than one-quarter acre per 100 feet of barrier length; maximum slope length and gradient behind the barrier is 100 feet and 50 percent (2:1), respectively.
- Do not use where effectiveness is required for more than 3 months. Useful life of erosion bale is approximately 1 year; the bales may have to be replaced one or more times during construction.
- Under no circumstances should erosion bale be constructed in flowing streams or in swales where flows are likely to exceed 1 cfs, and where the contributing drainage area is greater than 1 acre.
- Not to be used where the control of sediment is critical; in high-risk areas; in areas where they cannot be entrenched as required and firmly anchored; and areas where ponded water could flow onto the roadway.

Installation

- The erosion bale must be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked, the excavated soil must be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.
- Each bale must be securely anchored by at least two wooden stakes driven toward the previously laid bale to force the bales together. Stakes should be driven into the ground a minimum of 1 foot to securely anchor

Attachment 3. Examples of Best Management Practices (continued)

the bales. Stakes should have a minimum diameter or cross section of 2 inches. Reinforcing bars shall not be used in place of the wooden stake.

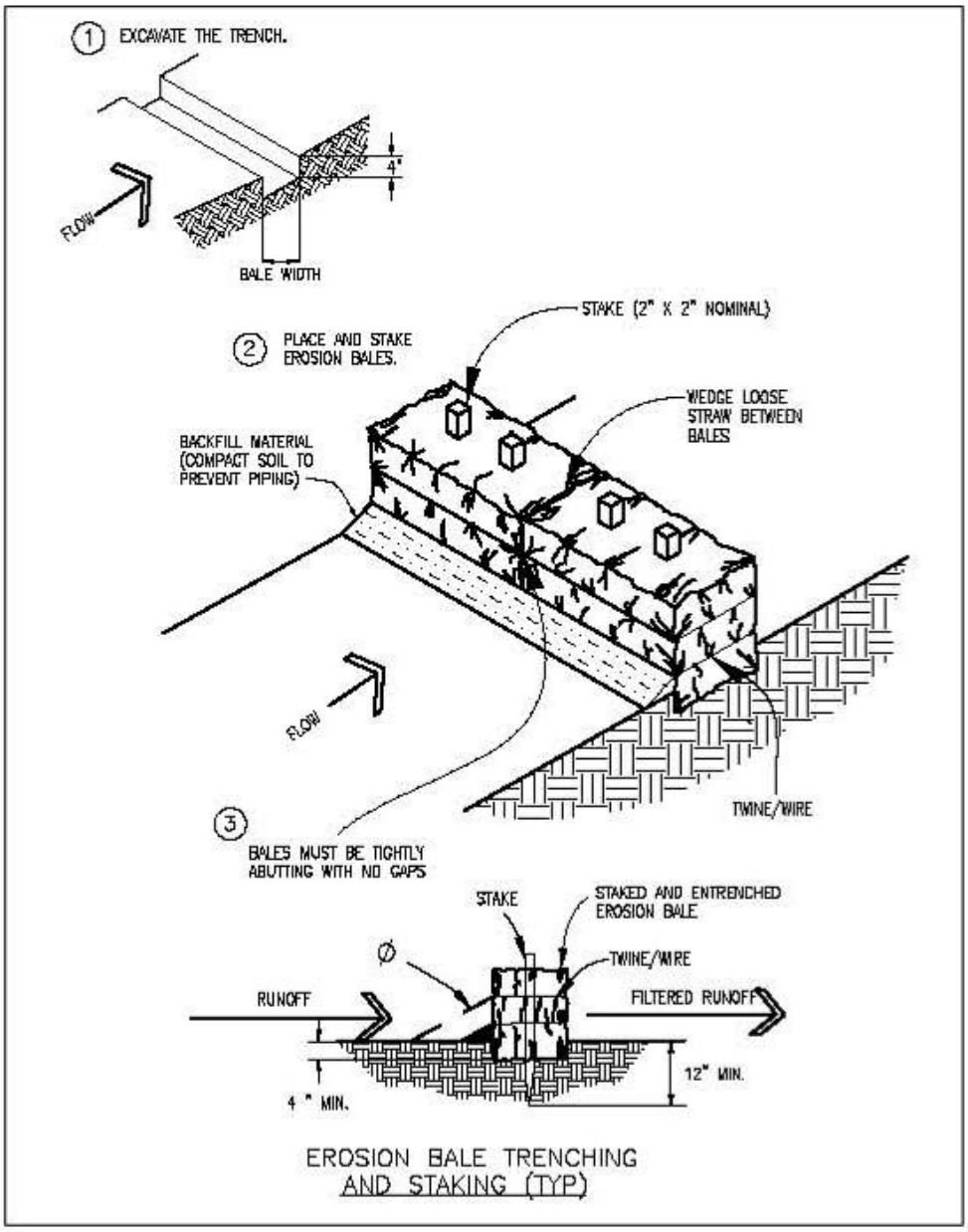


FIGURE SC 1.1
Erosion Bale Installation (CDOT[18])

- All bales must be either wire-bound or string-tied, and they should be installed so that bindings are oriented around the sides rather than along

the tops and bottoms of the bales (in order to prevent deterioration of bindings).

- The gaps between bales should be filled by wedging with straw to prevent water from escaping between the bales. The main consideration is to obtain tight joints. Erosion bales will not filter sediment or pond water if the water is allowed to flow between, around, or under the bales. Loose straw or hay scattered over the area immediately uphill from an erosion bale barrier tends to increase barrier efficiency.
- Along toe of fills, install the erosion bales along a level contour and leave enough area behind the barrier for runoff to pond and sediment to settle. A minimum distance of 5 feet from toe of the fill is recommended.

Maintenance and Inspection

- Erosion bales deteriorate quickly and, therefore, inspections during construction should be frequent. Repair or replacement should be made promptly as needed.
- Erosion bales must be removed when they have served their usefulness.
- Trenches where erosion bales were located should be graded and stabilized.
- Sediment accumulation against the erosion bale barrier shall be removed when it reaches half the exposed bale height. Sediments removed must be properly disposed.
- Replace erosion bales as necessary but at a minimum of once each year.

GP 5: Wind Erosion Control

Description Practices, such as applying water or dust palliatives, to be implemented during construction operations to prevent wind erosion from exposed soil surfaces.

Applications These practices are limited to exposed soil where wind erosion is expected.

Limitations The effectiveness of this application can be limited by soil, temperature, and wind velocity.

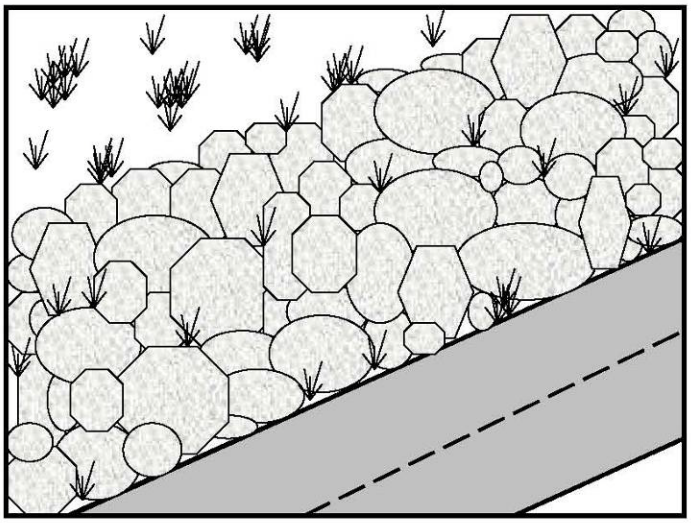
Standards and Specifications

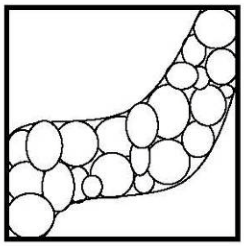
- Irrigation practices can be applied to a project site until the soil is moist and can be repeated as necessary. However, the soil shall not be over-saturated causing runoff to flow from the project site. The distribution system shall be equipped with a proper spray system to ensure even water distribution. When a distribution system is unavailable, at least one mobile unit shall be available at all times to apply water or a dust palliative to the project site. All non-potable tanks, pipes, and other conveyances shall be marked "non-potable water-do not drink."
- Seeding, mulching, soil binder, and grading techniques are also temporary methods to prevent wind erosion. Refer to BMPs EC 1, EC2, EC 4, and EC 13.

Maintenance and Inspection

- Inspect protected areas routinely for adequate protection and signs of degradation.
- Perform routine spot-checks to ensure wind erosion control techniques are properly implemented.

RIPRAP EC-7





MAP SYMBOL

Graphics produced by Kennedy/Jenks Consultants

Purpose: To stabilize and to protect soil from erosion in areas of concentrated runoff.

Application:

- Used on cut-and-fill slopes, channel side slopes, channel bottoms, inlets and outlets of culverts and slope drains, and streambanks.

Limitations:

- Riprap is not allowed for use as an erosion or sediment control on disturbed slopes within the City of Sparks.
- Slopes greater than 2H:1V may lose riprap.
- Measures should be taken to minimize erosion and excess turbidity in flowing streams during construction.

Standards and Specifications:

- Use a well-graded mixture of rock sizes.
- Use durable stone that won't quickly decompose from freeze/thaw cycles (i.e. granite).
- Riprap layers should be twice as thick as the maximum stone diameter.
- Use a filter cloth material or a layer of gravel as a filter between the riprap and the underlying soil surface.

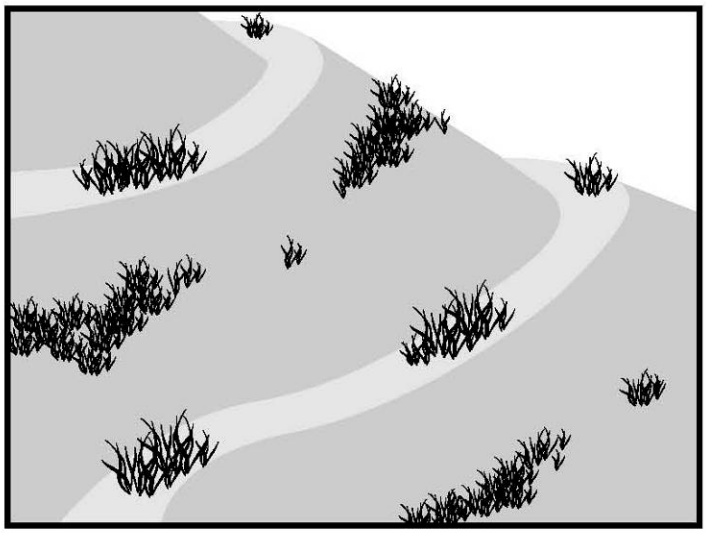
RIPRAP EC-7

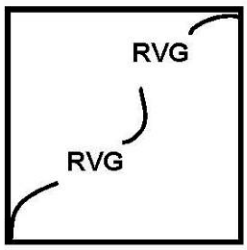
- Riprap should extend as high as the maximum flow depth in channels or streams (minimum of 4 feet) or to a height where vegetation will be satisfactory to control erosion.
- On curves, riprap should extend through the curve to five times the upstream and downstream curve endpoints.
- Riprap size depends upon site-specific conditions.

Inspection and Maintenance:

- Inspect annually and after major storms.
- Damaged riprap should be repaired immediately.
- Keep channel clear of obstructions such as trees and sediment bars.

REVEGETATION EC-8





MAP SYMBOL

Graphics used with permission of Caltrans

Purpose: To stabilize soils and slopes from raindrop impact and erosion, conserve soil moisture, decrease runoff, increase infiltration, and to provide wildlife habitat.

Application:

- Can be applied on slopes, adjacent to waterways, as buffer strips and landscape corridors, on stream banks and in cut and fill areas.

Limitations:

- Irrigation during dry weather may be required.
- Additional erosion control methods may be required if the site is prone to erosion.
- Sod is much more expensive than seeding.

Standards and Specifications:

- With the exception of frozen ground conditions, permanent revegetation must be seeded or planted no later than 21 days after final grading.
- Consider climate, soils, and topography when choosing the appropriate vegetation and seed mixes for installation. They should be developed based on site-specific conditions and soil testing may be required.
- Hydroseeding is a cost effect method of applying seed mixes.
- A combination of seed species should be used when the objective is to re-establish native species that require little to no irrigation.

REVEGETATION EC-8

- Refer to the attached list of suitable species for the Truckee Meadows.
- All seeding rates must be based on Pure Live Seed.
- Crested wheatgrass should never be the dominant species in a seed mix.
- Local climatic conditions and plant species will determine when to install vegetation.
- Increase revegetation success by roughening soils (EC-2) prior to seeding then applying mulch (EC-3) with a tackifier.
- Normally, unless slow release, fertilizers should not be applied.
- After seeding, grasses and legumes should emerge between 4-28 days.
- Plants should have a uniform density and should be well intermixed.
- Final stabilization requires that perennial vegetation has been established with a density of 70 percent of the native background cover.

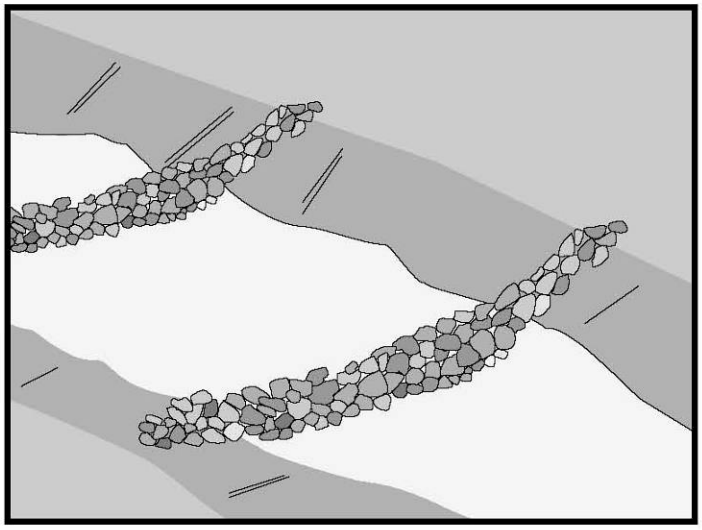
Sod

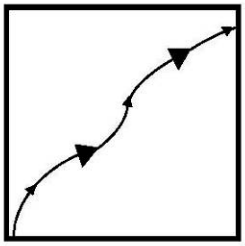
- Sod can provide immediate cover for critical areas.
- Sod should be free of noxious weeds, diseases, and insects.
- Strips of sod with a thickness between ½-inch and 2 inches should be laid perpendicular to the direction of runoff flows and should be staggered in a brick-like pattern.
- Sod should be secured with stakes when the slope is steeper than 3H:1V.
- The harvesting, delivery, and installation of sod should occur within 36 hours.
- Avoid installing sod on gravel or non-soil surfaces.
- Avoid installation during unusually hot, wet, or cold weather and do not mow the sod for 2-3 weeks after installation.

Inspection and Maintenance:

- Irrigation may be required until new vegetation has been firmly established.
- Seeded areas should be examined for failures. If failures have occurred the area should be reseeded, amended if necessary, and mulched during the planting season.
- Soil tests should be conducted to determine if soil inoculants, amendments or fertilizers are necessary.
- Water sod regularly and uniformly.

CHECK DAMS RC-3





MAP SYMBOL

Graphics used with permission of Caltrans

Purpose: To reduce erosion in channels, swales and ditches caused by high flow velocities through the installation of temporary dams constructed of rocks or gravel/sand bags.

Application:

- Used in small open channels draining 10 acres or less.
- Used in steep channels when runoff velocities exceed 5 feet/second.
- Used when establishing grass linings in channels or drainage ditches.

Limitations:

- Do not use in live streams.
- Do not use in channels draining areas greater than 10 acres.
- Do not construct a check dam with silt fencing or straw bales.
- Check dams should not be used as primary sediment-trapping devices.
- Extensive maintenance may be required following high flow events.

CHECK DAMS RC-3

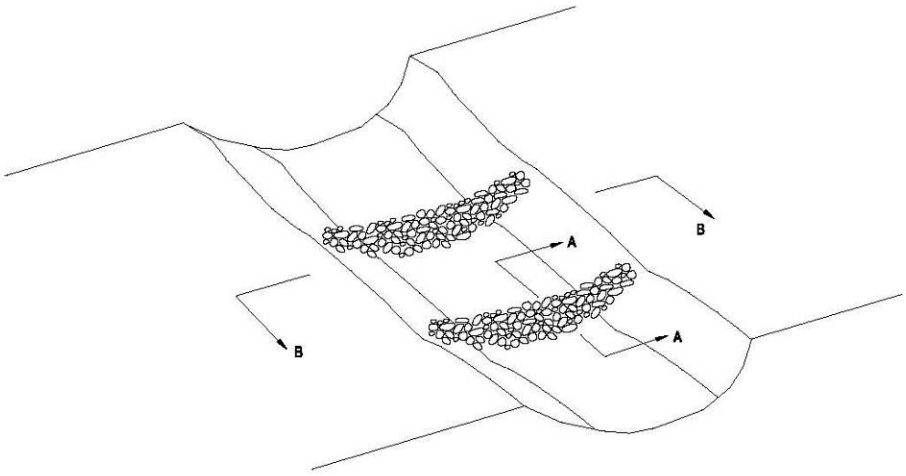
Standards and Specifications:

- Place check dams at a distance and height to allow small pools to form behind them.
- Space the dams at regular intervals based upon soil types and slope gradients. The first check dam should be installed approximately 30 feet upstream of the outfall device.
- Design a check dam to pass a 2-year, 24-hour storm without causing damage to the dam or any upstream flooding.
- Rock diameters should range between 8 and 12 inches.
- The maximum height of a check dam is 4 feet from the upstream toe to the crest and the center of the dam.
- The crest and the center of the dam should be 6 inches lower than the edges.
- Install (keyed) dam materials at least 6 inches into the sides and bottom of the channel.
- Rocks should not be dumped in the construction of the check dam. Rocks should be placed individually by hand or by mechanical methods.
- The downstream toe of the dam should be met by the backwater from the downstream check dam if multiple check dams are installed.
- Check dams should be removed once vegetation has been established in a channel. Check dams may be left in place if the check dam is designed as a permanent structure in accordance with local drainage policies.
- From October to May, do not allow water to pond behind check dams for more than 7 days.

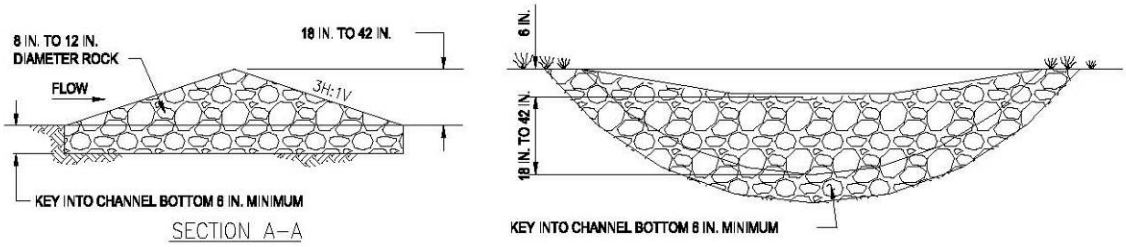
Inspection and Maintenance:

- Inspect regularly and after each runoff event for sediment buildup and signs of erosion under or around the dam.
- Replace loose material.
- Remove accumulated sediments when it reaches one third of the check dam height.
- Remove accumulated sediments prior to performing soil stabilization or permanent seeding practices.
- Remove check dam and accumulated sediments when dams are no longer needed.
- Dispose of accumulated sediments properly.

CHECK DAMS RC-3



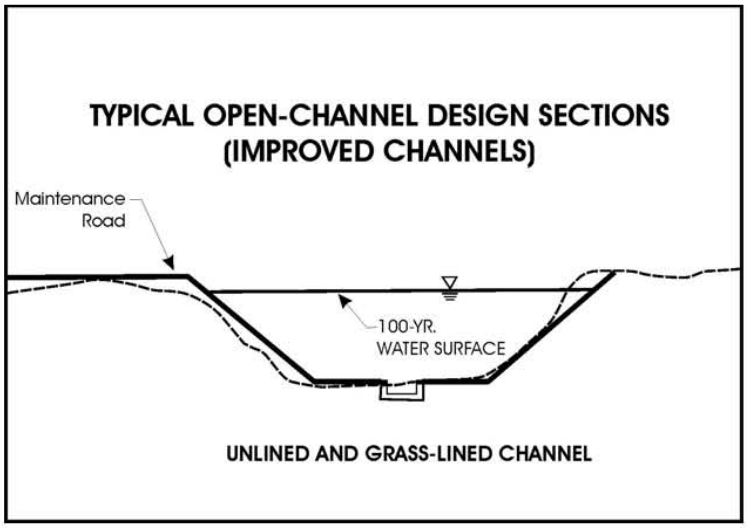
TEMPORARY CHECK DAM
(ADAPTED FROM CALTRANS)



ROCK CHECK DAM
NOT TO SCALE

Graphics adapted from Caltrans.

PERMANENT DIVERSIONS RC-1



Graphic produced by Kennedy/Jenks Consultants

Purpose: To design permanent facilities to collect stormwater runoff and/or stream flow and convey it away from disturbed ground to an appropriate outlet or downstream drainage channel.

Application:

- To decrease the threat of runoff from upstream watersheds that could pose a hazard resulting in property damage or erosion.
- To protect upland slopes by reducing slope lengths and minimizing erosion and soil loss.
- To reduce runoff velocities and increase stability by reducing channel slope and adding channel liners.

Limitations:

- May require watershed modeling and engineering design.
- Constructed channels must be stabilized so that they are not subject to the same erosion potential as the disturbed areas they are meant to protect.
- May require additional measures to ensure channel stability and function.

PERMANENT DIVERSIONS RC-1

Standards and Specifications:

Open Channels for Stormwater and Diverted Stream Flows

- Permanent open channels must be designed by a professional registered engineer according to the criteria outlined in the drainage design manual of the appropriate jurisdiction.
  - Reno – Public Works Design Manual, latest edition.
  - Sparks and Washoe County– Hydrologic Criteria and Drainage Design Manual, latest edition.
- Refer to the drainage design manual of the appropriate jurisdiction regarding velocity limitations, channel liners, channel drops and energy dissipation structures.

Paved Flumes

- Divert stormwater runoff down the face of a slope without causing erosion problems on or below the slope.
- Outfall protection must be provided to prevent damage from high velocity flows.
- Maximum slope of the flume structure should not exceed 1.5H:1V
- Cutoff walls should be installed at upstream and downstream ends and along the length of the flume to prevent undermining.
- Anchor lugs should be placed along the length of the flume to prevent movement.
- Expansion joints and transverse joints should be placed along the length of flumes.
- Outlets must be protected using the appropriate energy-dissipating structures.

Outlet Protection

- Structurally lined aprons or other energy dissipating devices placed at the outlets of pipes to decrease the velocity of stormwater flows.
- No bends should be present in the horizontal alignment.
- Invert elevations should be equal at the receiving channel and at the downstream end of the apron.
- No overfall should occur at the end of the apron.
- Side slope of the receiving channel should not be steeper than 2H:1V.

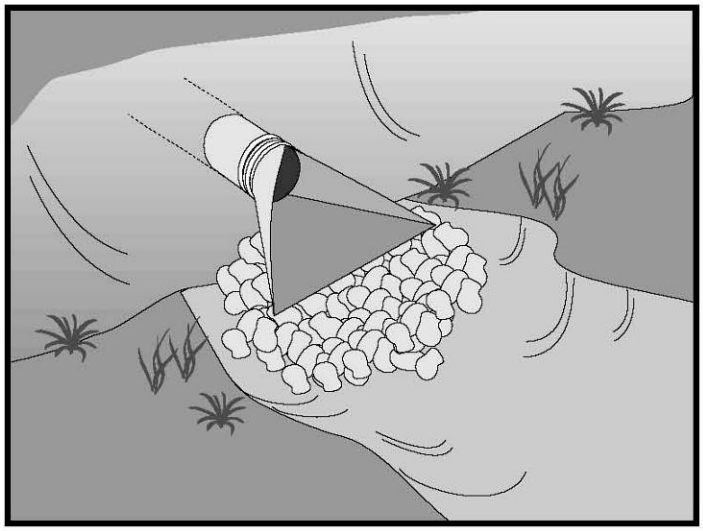
PERMANENT DIVERSIONS RC-1

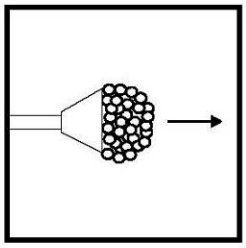
- Riprap, grouted riprap, concrete, or gabion baskets should be used to line the apron.
- Where velocities warrant, filter cloth should be placed between the channel and the riprap to prevent soil movement.
- Additional specifications are provided on the Stormdrain Outlet Protection (DP-2) fact sheet.

Inspection and Maintenance:

- Inspect channels and outfalls a minimum of once a week and after every rainfall until the area is stabilized.
- Inspect competency of rip-rap or channel lining after runoff events.
- Keep channels clear of sediment.
- Reseed areas if vegetative cover is not established.

STORMDRAIN OUTLET PROTECTION DP-2





MAP SYMBOL

Graphics used with permission of Caltrans

Purpose: To reduce stormwater flow velocities and energy from construction sites by placing a section of rock at pipe outlets and within channels. Permanent installations must be designed per local standards noted in drainage design manuals.

Application:

- At locations where discharge velocities and energies may erode downstream reaches.
- Pipe, drain, culvert, conduit or channel outlets.
- At outlets located at the bottom of mild to steep slopes.
- At the outlets of channels that carry continuous flows.
- Outlets subject to short, intense flows of water.
- Points where lined conveyances discharge to unlined conveyances.

Limitations:

- Loose rock may be washed away during high flow events.
- Freeze and thaw cycles may break down grouted riprap.
- Inadequate drainage may cause grouted riprap to break up due to hydrostatic pressure.

STORMDRAIN OUTLET PROTECTION DP-2

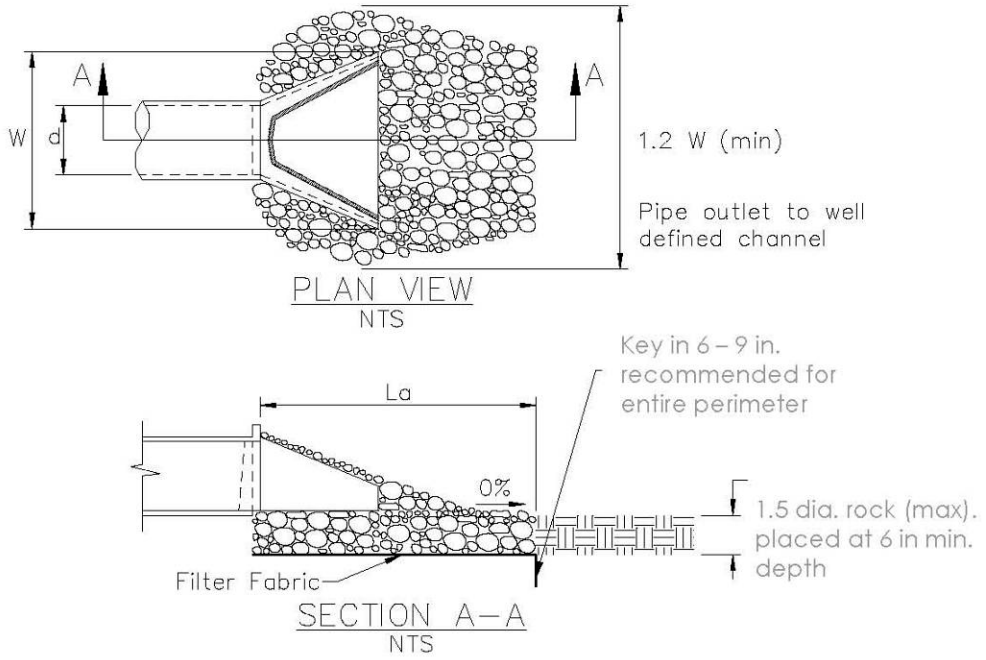
Standards and Specifications:

- Riprap, grouted riprap, or concrete aprons should be installed at all outlets. Riprap aprons are well suited for use during construction.
- Provide additional protection for outlets on slopes steeper than 10 percent.
- Higher outlet velocities require larger rocks.
- Minimum rock size is 6-inch diameter.
- Flow must be slowed to non-erosive velocity.
- The apron should be aligned with the receiving stream and it should be kept straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of apron.
- The underlying filter fabric should be protected with a gravel blanket if the riprap is too large.

Inspection and Maintenance:

- Inspect weekly and after every significant rainfall event.
- Check for displacement of riprap or damage to underlying fabric.
- Check for scour beneath the riprap and around the outlet.
- Replace riprap as needed.
- Repair damage to slopes or underlying filter fabric.
- Remove promptly all devices when the drainage area has been stabilized or at the completion of construction.
- Modify outlet protection if downstream erosion is evident.
- Remove temporary facilities from service when construction is complete. Outlet protection may be left in place if designed to be a permanent installation per local standards and specifications.

STORMDRAIN OUTLET PROTECTION DP-2



Graphic used with permission of Caltrans.

Pipe Diameter in	**Discharge** ft^3/s	**Apron Length, La** ft	**Rip Rap D_{50} Diameter Min** in
12	4.9	10	4
	9.9	13	6
18	9.9	10	6
	20.1	16	8
	30.0	23	12
	39.9	26	16
24	30.0	16	8
	39.9	26	8
	50.1	26	12
	60.0	30	16
For larger diameters or higher flows, consult a Registered Civil Engineer			

Source: USDA – SCS