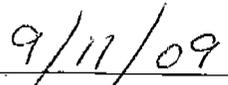


U.S ARMY
INSTALLATION MANAGEMENT COMMAND
And
FORT LEONARD WOOD

STORMWATER MANAGEMENT PLAN
IN SUPPORT OF MUNICIPAL SEPARATE STORM
SEWER SYSTEM REQUIREMENTS



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Date

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2. Installation Setting

2.1 Installation Location

The U.S. Army Maneuver Support Center (MANSCEN) and Fort Leonard Wood is where all chemical, engineer and military police and transportation Soldiers, plus Marines, Airmen, Sailors and international students from allied nations receive training.

Fort Leonard Wood is located in the beautiful south central Missouri Ozarks, covering more than 61,411 acres. The Fort is predominantly located in Pulaski County, which has a population of nearly 45,000. Bordering the installation to the north are the towns of Waynesville and St. Robert, with an approximate combined population of 6,700. The post is two miles south of Interstate 44.

2.2 Installation History

Groundbreaking ceremonies for the establishment of the Seventh Corps Area Training Center, later designated as Fort Leonard Wood, took place on December 3, 1940. The installation was officially designated Fort Leonard Wood in early January 1941. The post is named for Major General Leonard Wood, a distinguished soldier who served the United States for 40 years.

Fort Leonard Wood's original training task was to be home of the 6th Infantry Division. Later, the 8th, 70th, 75th and 90th Infantry Divisions were also trained at the installation. Additionally, many other non-divisional units trained at the post. More than 300,000 soldiers trained at Fort Leonard Wood during World War II on their way to serve in various capacities.

An Engineer Replacement Training Center began to form at Fort Leonard Wood in March 1941, because of the growing size of the Engineer force and limited training facilities at Fort Belvoir, Virginia. With the end of World War II in 1945, training declined at the post and ceased completely in the spring of 1946. The post was placed on the inactive list until 1950, during which time a small caretaker unit maintained some of the facilities that were used for summer training by National Guard units.

The Army announced that Fort Leonard Wood would be reopened on August 1, 1950, to provide basic and engineer training for soldiers slated to serve in Korea. In 1956, following the end of the Korean War, the installation was designated as the U.S. Army Training Center Engineer, officially designating Fort Leonard Wood as a permanent post. In light of this designation, the post received substantial funding to replace its wooden facilities with permanent brick structures. Construction during the 1950s and 1960s allowed the post to handle the substantial increase in training workload brought on by the Vietnam War. Fort Leonard Wood trained more than 120,000 soldiers in 1967 in such skills as basic training and

Engineer training, and such specialties as clerks, cooks, bakers, wiremen, mechanics, and motor vehicle operators.

By the mid-1970s, construction equipment operators for the U.S. Marine Corps and the U.S. Air Force were being trained at the post. Engineer training to other nations also began at this time. In 1982, Engineers from 15 foreign countries were being trained by the 4th Training Brigade. In the late 1980s, the U.S. Army Engineer School in Fort Belvoir, Virginia moved to Fort Leonard Wood due to lack of training space. For the first time in nearly 50 years, all military Engineer training would take place at the same location.

As a response to the closure of Fort McClellan in 1995, Fort Leonard Wood accommodated Fort McClellan's Military Police and Chemical Schools by the year 2000. The two schools would join Fort Leonard Wood's Engineer School under a combined command, Maneuver Support Center (MANSCEN). MANSCEN's mission is to provide the nation with individuals having strong values, skills in leadership and basic combat, and individual skills in chemical, engineering, military police, and transportation disciplines.

3. Installation Physical Characteristics

3.1 Climate

Fort Leonard Wood has hot humid summers and cold winters, receiving cold air moving south from Canada and warm, moist air moving north from the Gulf of Mexico, classifying its climate as continental. Annual temperatures range from below 0°F in winter to above 100°F in summer. Winters are generally mild with occasional snow accumulating at less than 20 inches per year. Fort Leonard Wood averages about 45 inches of rainfall a year.

3.2 Topography

Fort Leonard Wood is located within the Salem Plateau of the Ozark Plateaus Physiographic Province. The area is characterized by rugged terrain of thin soils and narrow steep-walled valleys. Most of Fort Leonard Wood is located on a broad upland ridge between the northerly flowing Big Piney River to the east and the northerly flowing Roubidoux Creek to the west. Tributary streams to Big Piney River and Roubidoux Creek drain the upland areas and are deeply incised into the sides of the ridges. Area relief generally is the result of gradual uplift of the Ozark Dome in southern Missouri and erosion of the uplifted rocks by precipitation runoff and stream flow. The regional ground surface elevation ranges from 1,150 feet above mean sea level along the central ridge to 750 feet at the Big Piney River near the northeastern corner of Fort Leonard Wood.

3.3 Regional Geology

Fort Leonard Wood lies on the western flank of the Ozark Uplift of Southern Missouri. The Ozark Uplift is part of a large Precambrian rhyolite-granite basement complex. Through a series of depositional and erosional cycles extending from Cambrian through Pennsylvanian time, progressively younger geologic formations crop out in roughly concentric rings around the core of Precambrian rocks.

Bedrock exposed at Fort Leonard Wood is part of the Ozark Aquifer. The Ozark Aquifer is underlain by the St. Francois confining unit and St. Francois aquifer. The St. Francois confining unit impedes the vertical movement of groundwater between the Ozark and St. Francois aquifers. The basement confining unit, which is comprised of Precambrian-age igneous and metamorphic rocks, underlies the St. Francois aquifer. Bedrock units of Early Ordovician age including the Jefferson City Dolomite, Roubidoux Formation, and Gasconade Dolomite are the only bedrock units exposed at Fort Leonard Wood.

The Gasconade Dolomite is predominantly a cherty dolomite commonly exposed as bluffs along the Big Piney River and Roubidoux Creek valleys. The unit is about 300 feet thick and can be separated into upper (30 to 50 feet thick) and lower (250 feet thick) parts based on the amount of chert and bedding characteristics.

The overlying Roubidoux Formation consists of nearly pure quartzose sandstone, dolomitic sandstone, and cherty dolomite. The amount of sandstone ranges from 10 to 25 percent throughout most of the Fort Leonard Wood area. The pre-erosional thickness of the Roubidoux Formation ranges from 100 to 200 feet. The Roubidoux Formation crops out across most of the upland areas and hillsides in the western, northern, and eastern portions of Fort Leonard Wood. Dissolution of interbedded dolomite in the lower Roubidoux Formation has resulted in the collapse of the overlying sandstone-rich beds. Most sinkholes occurring in the upland areas of Fort Leonard Wood are formed in the Roubidoux Formation.

The Jefferson City Dolomite crops out extensively in upland areas on the southern part of Fort Leonard Wood at a thickness up to 180 feet. This unit is not present in the northern and eastern parts of the installation. The formation consists of finely crystalline argillaceous dolomite that contains shale partings and brecciated chert. A massive bed of gray, finely crystalline argillaceous dolostone informally referred to as the Quarry Ledge, because of its resistance to erosion, occurs about 30 feet above the base of the unit.

Residuum consisting of clayey chert and cherty clay derived from the weathering of dolomite is present across upland areas of the Fort Leonard Wood area. The clay may be interbedded with layers of sand or weathered sandstone where the Roubidoux Formation crops out. The thickness of residuum varies across the installation and has likely been altered in areas where historic and current operations have been conducted. Thicker deposits of residuum on the upland areas may be associated with collapse features such as filled sinkholes. A variable thickness of alluvium is present along the Big Piney River, Roubidoux Creek, and tributaries

to both. The alluvium consists of sorted and unsorted sands, silt, gravel, and clay, and is generally less than 30 feet thick.

3.4 Karst Features and Fracture Patterns

The permeability of bedrock units within the Fort Leonard Wood area has been greatly increased through the dissolution of dolomitic bedrock units. Karst features at Fort Leonard Wood commonly are well developed and include sinkholes, springs, losing streams, and caves. These features are more common in the central and northern parts of the site, where the Roubidoux Formation and Gasconade Dolomite crop out.

Many of the sinkholes in the north-central part of Fort Leonard Wood are distributed along a 1 mile-wide linear band trending northeast to southwest. The major axis of the band is parallel to and in line with a 1.5-mile linear segment of Roubidoux Creek within a reach characterized by a sequence of near right-angle shifts in flow direction and complete flow loss. The axis also intersects Hurd Hollow Stream at the point of flow loss. The occurrence of abrupt changes in stream channel directions, linear stream segments, flow loss in two streams, and a linear band of sinkholes oriented along a common axis strongly indicates an area of substantial hydrogeologic control by fractures. Two narrower bands of sinkholes with major axes oriented northwest to southeast are also evident and intersect the main northeast to southwest alignment of sinkholes. Extensions of the major axes of these two bands intersect near-linear segments of Roubidoux Creek northwest of Fort Leonard Wood. One of the bands also intersects a near linear 1-mile reach of Smith Branch. These features are also indicative of fracture control.

3.5 Regional Hydrogeology

The regional groundwater table generally occurs within the lower Roubidoux Formation or upper Gasconade Dolomite within the Fort Leonard Wood area. Both geologic units are productive, water-bearing units with well yields ranging from several tens to several hundreds of gallons per minute. The underlying Potosi Dolomite is the most productive water-bearing unit in the Ozark Aquifer, with well yields ranging from several hundred to as much as 1,000 gallons per minute. The Gasconade Dolomite and Potosi Dolomite are separated by the Eminence Dolomite, which forms a weak hydraulic barrier between the two geologic units.

Recharge to groundwater at Fort Leonard Wood occurs through percolation of rainfall through permeable residuum and bedrock. Groundwater flow patterns at Fort Leonard Wood are the result of a complex combination of diffuse flow through porous residual material and bedrock and conduit flow through solution-enlarged openings along bedding planes and interconnected fractures. Depths to groundwater may range from 130 to 300 feet below ground surface in the upland areas to less than 25 feet in the Big Piney River or Roubidoux Creek valleys. Groundwater levels and groundwater flow directions are similar under conditions of high base flow and low base flow.

A north-trending groundwater divide occurs in Fort Leonard Wood with groundwater flowing away from the uplands along the axis of this divide east towards Big Piney River or west towards Roubidoux Creek. Karst features alter the movement of groundwater from flow patterns commonly associated with rock of more uniform permeability. Lateral separation between the groundwater and topographic divides in the central and northern parts of Fort Leonard Wood (between Bloodland Lake and the north part of the cantonment area) indicate larger bedrock permeability in the east-central rather than the west central part of the installation. Groundwater that would normally flow west to Roubidoux Creek has been captured by a zone of large secondary permeability and redirected east toward the Big Piney River. Vertical groundwater flow generally is downward from the Gasconade Dolomite to Potosi Dolomite, but it may be upward in areas of highly permeable karst terrain where groundwater levels in the Roubidoux Formation and Gasconade Dolomite are lowered because of rapid flow of groundwater through conduits to nearby springs.

3.6 Spring Recharge Basins

US Geological Survey (USGS) studies have identified a connection between sinkholes and losing streams located at Fort Leonard Wood with four known perennial springs including Miller Spring, Sandstone Spring, Roubidoux Spring, and Shanghai Spring. A recharge area for Roubidoux Spring has not been defined. The boundary between the recharge basins of the other three springs may overlap with each other or encompass a larger area within or outside the installation boundary.

Shanghai Spring is located along the Big Piney River about 2.5 miles northeast of the northern installation boundary. The Shanghai Spring recharge basin is 27 square miles in area and encompasses a substantial part of the north-central and northeastern parts of Fort Leonard Wood. The estimated average base-flow discharge of Shanghai Spring is 18 cubic feet per second. Previous USGS dye-trace tests have indicated a subsurface connection between losing streams within the Fort Leonard Wood/St. Robert area and Shanghai Spring. As a result of this connection, the water quality of the spring has been influenced by activities within the town and military installation. Dye-trace tests have confirmed the subsurface connection between Shanghai Spring and the point where treated effluent from the Fort Leonard Wood Wastewater Treatment Plant is discharged to Dry Creek on the northern part of the installation. A dye test conducted in 1996 indicated groundwater migration at a travel rate of approximately 0.2 mile per day between the point of water loss in Dry Creek downstream of the Wastewater Treatment Plant and Shanghai Spring (2.8 miles).

Miller and Sandstone Springs receive groundwater from much of the east-central part of Fort Leonard Wood. The Sandstone Spring recharge basin is about 3 square miles in area, and the Miller Spring recharge basin about 17 square miles.

3.7 Surface Water Hydrology

Surface water drainage within Fort Leonard Wood is predominantly through small ephemeral streams whose flow direction is influenced by a topographic ridge that divides the eastern and western parts of the installation. Ephemeral streams exist only for a few days following a precipitation event and are located above the groundwater table year-round. Precipitation rather than groundwater is the source of recharge for these streams. Drainage systems on the eastern part of Fort Leonard Wood discharge water to the Big Piney River, and drainage system on the western part discharge water to Roubidoux Creek. Big Piney River, a perennial stream, and Roubidoux Creek, an intermittent stream along the western boundary of Fort Leonard Wood, flow northward and discharge water into the Gasconade River. Several man-made ponds and lakes have been constructed near topographic ridges south of Forney Army Airfield. Most impoundments are constructed at the headwater areas of small ephemeral streams.

Roubidoux Creek is not as deeply incised, nor does it have as large a flow as the Big Piney River. Base flow along the Roubidoux Creek fluctuates dramatically in the Fort Leonard Wood area. Except during high-flow conditions caused by large amounts of runoff, a 7 to 8 mile reach of Roubidoux Creek along the western boundary of Fort Leonard Wood is dry. The reach where most flow loss occurs is near the intersections of Roubidoux Creek, the Countyline Fault, and Hurd Hollow Fault. Approximately 30 percent of the spring flow at Roubidoux Spring is not attributed to surface water lost upstream in Roubidoux Creek.

Larger springs present in the Big Piney River Basin near the eastern border of Fort Leonard Wood include Miller Spring and Sandstone Spring. Shanghai Spring is located downstream of Fort Leonard Wood in the Big Piney River Basin, and Roubidoux Spring is located downstream of the installation within the Roubidoux Creek Basin. Several smaller perennial and wet-weather springs, such as Ballard Hollow, FLW Road 32, and several unnamed springs, discharge from solution-enlarged bedrock contacts and fractures throughout Fort Leonard Wood.

3.8 Groundwater Use

Although the Ozark aquifer is used extensively for domestic and public water supply, Fort Leonard Wood obtains 98 percent of its drinking water from a pumping station located on the Big Piney River near Sandstone Spring.

A smaller quantity of groundwater is supplied from eight public water-supply wells at Fort Leonard Wood. A public water supply well, DW-015, also known as Indiana Avenue well, is located on the northern part of the installation and used only during peak demand. The remaining wells supply drinking water to training facilities scattered across the installation. These wells provide a much smaller quantity of water than the DW-015. Pumping records are not maintained for these wells.

4. Land Use

Fort Leonard Wood is situated in south-central Missouri, 130 miles southwest of St. Louis and 93 miles northeast of Springfield. Most of the installation is within Pulaski County, with small parts extending into Texas and Laclede counties. It comprises 61,411 acres of land, of which 58,436 acres are unimproved. Additionally, 9,700 acres of U.S. Forest Service land are located within in the boundaries. Fort Leonard Wood is bordered on the east, south, and west by the Houston-Rolla Unit of the Mark Twain National Forest, on the east by the Big Piney River, and on the west by Roubidoux Creek.

Fort Leonard Wood has established a cantonment area in the north-central part of the installation. The area is highly developed and contains most of the buildings and structures within the facility. Areas outside the cantonment area are operational ranges for small arms training, vehicle maneuvers, heavy equipment training, aerial strafing, and bombardment training.

5. Ecology

Fort Leonard Wood is situated in the Osage/Gasconade Hills section of the Ozark Highlands ecoregion of the Eastern Temperate Forest. Major habitat types found on the site are forests, grasslands, and wetlands/riparian zones. The following descriptions of the habitats and biota found at Fort Leonard Wood have been adapted from the 2007 Integrated Natural Resources Management Plan and Environmental Assessment for Fort Leonard Wood.

5.1 Habitats

Forest habitats are the principal vegetative type of Fort Leonard Wood, covering about 75 percent of the installation. A variety of forest types are found depending on the location. The predominate type is the oak-hickory association, but the sycamore-elm-soft maple association is found on creek and river bottomlands. North-facing slopes generally are forested in black, red, and white oak with a scattered understory of flowering dogwood, serviceberry, and Carolina buckthorn. Species common to south-facing slopes are post oak, blackjack oak, and black hickory. Eastern red cedar forms small dense stands on former glade areas and invades old farm fields and other highly disturbed sites. Shortleaf pine occurs naturally in small isolated stands. Central Missouri is the extreme northern range of the species. Shortleaf pine was also historically planted in plantations on Fort Leonard Wood.

Old fields and grassland habitats occupy about 15 percent of Fort Leonard Wood. Many of these sites, where they occur on the upland, were part of the original presettlement post oak savanna habitat. These sites are covered with a mix of herbaceous, low woody, and invading trees. Common vegetation in old field areas are annual grasses; broom sedge; a mix of

legumes, and composites; Kentucky bluegrass and tall fescue (both introduced); and tall, native, warm season perennial grasses, including Indian grass, big bluestem, little bluestem, and switchgrass. Low woody growth is commonly dewberry, blackberry, coralberry, rose, sumac, plum, persimmon, and sassafras. Common invading trees are post oak, blackjack oak, black hickory, and eastern red cedar.

Riparian bluffs and waterway corridor habitats consist of streams and stream beds, floodplains up to the 100-year flood line, river terraces, rock cliffs and bluffs, short steep gradient tributaries, and ends of flat and narrow ridge tops. Wetlands are dispersed throughout Fort Leonard Wood and are primarily associated with the Big Piney River and Roubidoux Creek. However, wetlands are also associated with perennial streams, small springs, seeps, and sinkholes.

A wetland inventory in 1995 identified 1,552 acres of potential jurisdictional wetlands on Fort Leonard Wood. The largest sites occur in the Roubidoux Creek (848 acres), Big Piney River (530 acres), and Falls Hollow floodplains (30 acres). Collectively, these three drainages support 90 percent of the total wetland acreage identified for Fort Leonard Wood. The wetlands inventory identified the following eight wetland types on Fort Leonard Wood, in order of decreasing abundance: bottomland hardwood, shallow marsh, shrub swamp, shrub flat, wet meadow, gravel bar, deep marsh, and spring-associated wetlands. Bottomland hardwoods and shallow marshes collectively comprise about 97 percent of wetlands mapped.

5.2 Biota

Habitats of Fort Leonard Wood support diverse plant and animal communities.

Approximately 765 taxa of herbaceous and woody plants are known or thought to occur on the installation. Various inventories have confirmed the occurrence of 53 mammal, 211 bird, 65 fish, 37 reptile, and 22 amphibian species on Fort Leonard Wood.

Mammals commonly occurring on Fort Leonard Wood include the white-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), eastern fox squirrel (*S. niger*), eastern cottontail rabbit (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), beaver (*Castor canadensis*), Virginia opossum (*Didelphis virginiana*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), four species of shrews, and two species of bats.

The largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), bluegill (*Lepomis macrochirus*), green sunfish (*L. cyanellus*), bleeding shiner (*Luxilus zonatus*), channel catfish (*Ictalurus punctatus*), rock bass (*Ambloplites rupestris*), and rainbow trout (*Oncorhynchus mykiss*) are common fish species found in streams and ponds on Fort Leonard Wood. Several species of game fish are stocked in Bloodland Lake to support sport fishing opportunities. Channel catfish are stocked annually in impoundments across Fort Leonard Wood. The number stocked per pond is dependent upon pond characteristics. Stocking of largemouth bass and bluegill is based on individual impoundment fisheries

surveys. Fingerling largemouth bass, channel catfish, and bluegill are stocked in newly developed ponds. For about 30 years, trout have been stocked at the Stone Mill Spring Branch. The Stone Mill Spring Branch became the responsibility of the U.S. Forest Service in 2001 as part of the land transfer between Fort Leonard Wood and the U.S. Forest Service.

Reptiles and amphibians commonly occurring in Fort Leonard Wood include the common map turtle (*Graptemys geographica*), common musk turtle (*Sternotherus odoratus*), three-toed box turtle (*Terrapene Carolina triunguis*), bull frog (*Rana catesbeiana*), pickeral frog (*R. palustris*), green frog (*R. clamitans melanota*), eastern gray treefrog (*Hyla versicolor*), dwarf American toad (*Bufo americanus charlesmithi*), southern redback salamander (*Plethodon serratus*), northern fence lizard (*Sceloporus undulatus hyacinthinus*), ground skink (*Scincella lateralis*), five-lined skink (*Eumeces fasciatus*), southern coal skink (*E. anthracinus pluvialis*), western worm snake (*Carphophis vermis*), black rat snake (*Elaphe obsoleta*), and Eastern garter snake (*Thamnophis sirtalis*). In 1998, 21 amphibian species and 30 reptile species were observed in Fort Leonard Wood.

Twenty-seven species of unionid mussels and the introduced Asiatic clam are known to occur in the Big Piney River and Roubidoux Creek within Fort Leonard Wood. Two species of crayfish, golden crayfish (*Orconectes luteus*), and spothanded crayfish (*O. punctimanus*), are known to commonly occur in the waters of Fort Leonard Wood.

5.3 Status of Listed Species

Twenty-five species of plants and animals known to or suspected to occur on Fort Leonard Wood are listed as species of concern. Three federal listed species have been recorded on Fort Leonard Wood: Indiana bat (*Myotis sodalis*), gray bat (*M. grisescens*), and bald eagle (*Haliaeetus leucocephalus*). The Indiana bat primarily uses the caves of Fort Leonard Wood for winter hibernation. The current winter population on or adjacent to the installation is roughly 500 individuals. Gray bats occur throughout much of the southern half of Missouri. Fort Leonard Wood is near the center of the species range in Missouri. One maternity colony of gray bats occurs on Fort Leonard Wood.

Bald eagles are year-round residents. Fort Leonard Wood contains an active bald eagle nest on the Big Piney River. Wintering bald eagles occur on Fort Leonard Wood from November through March. The highest concentration of eagles occurs in the southwestern part of the installation.

Six rare plant species have been documented on Fort Leonard Wood. The only species currently federal- or state-listed is the narrowleaf rushfoil (*Crotonopsis linearis*), which has a state rank of S1 (critically imperiled in the state). Narrowleaf rushfoil has only been identified once in 1932 on the western side of Roubidoux Creek, south of Cookville. Subsequent surveys have failed to detect any further occurrences.

Another 27 plant and animal species listed as threatened or endangered on the federal or State of Missouri list are found or suspected to occur within a 100 mile radius of Fort Leonard

Wood. Because of the diversity of sub-ecoregions and habitats found within a 100 mile radius of the installation, it is unlikely that many of these species would actually occur within the immediate vicinity of Fort Leonard Wood.

6. Stormwater Management Plan Overview

This Storm Water Management Plan (SWMP) describes the procedures and practices Fort Leonard Wood currently uses throughout the installation to limit the discharge of pollutants from its storm drainage systems. The SWMP also documents the commitment by Fort Leonard Wood to develop and implement additional storm water management procedures and practices to comply with each of the six minimum control measures stated in the Municipal Separate Storm Sewer (MS4) Permit. This plan presents a summary of each of these measures supported by multiple activities (best management practices) currently taking place or to be implemented during the initial five - year permit cycle.

The Fort Leonard Wood SWMP is intended to guide the installation in planning, funding and implementing a comprehensive program for addressing current and future regulatory and policy requirements for managing stormwater runoff. The installation's stormwater program currently consists of many separate programs, conducted by the Directorate of Public Works. These programs are typically implemented to respond to regulatory requirements, the need for public services and safety, and the installation's commitment to protect and improve the quality of its natural resources. Examples include capital improvement projects for stormwater and flood control, maintenance of public stormwater systems, resource monitoring of streams to assess and respond to water quality problems, and erosion and sediment control for construction activities.

1. The purpose of the SWMP is to comprehensively address how to meet the many different but related regulations, programs, and policies that affect stormwater, flooding and associated water resources. Achieving these goals and meeting regulatory requirements will require more than simply strengthening existing installation programs. As per state regulatory agency and EPA guidance, a watershed approach shall be taken. This would in effect couple all of the six minimum control measure BMPs with a renewed installation-wide emphasis on protecting water quality and reducing runoff. Sustainable solutions such as implementation of green infrastructure, stormwater BMPs, and conventional source reduction techniques must all play significant roles for a successful Stormwater Management Program at Fort Leonard Wood. This watershed approach will also bring Fort Leonard Wood into alignment and compliance with the following regulations:
 - 1) LD: 40 CFR 122, 123, and 124 National Pollution Discharge Elimination System
 - 2) Energy Independence and Security Act of 2007, Section 438
 - 3) Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management" (Federal Register, Vol. 65, No. 202, October 18, 2000)
 - 4) Army Regulation 200-1

The installation's Stormwater Management Plan shall be implemented using a watershed approach to prevent and reduce pollution of surface and ground waters in a unified and cost-effective manner.

7. Stormwater Management Plan for Minimum Control Measures

‘Minimum Control Measures’ is the term used by the Environmental Protection Agency (EPA) for the six Municipal Separate Storm Sewer program elements named below, aimed at achieving improved water quality through NPDES Phase II requirements:

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post-construction Storm Water Management
- Pollution Prevention/ Good Housekeeping

The goal of the storm water management plan is to reduce the discharge of pollutants to the ‘Maximum Extent Practicable’, as defined by the EPA, and to identify activities or structural improvements that help improve the quality of the storm water runoff. In an effort to reduce the discharge of pollutants to the maximum extent practicable, Best Management Practices (BMPs) have been developed for the storm water plan. BMPs include treatment controls, operating procedures, and practices to control site runoff, spills and leaks, waste disposal, and drainage from raw material storage. BMPs will be updated as appropriate to comply with additions or changes to NPDES permit requirements. Full development and implementation of the BMPs will be completed through the five-year implementation plan as presented in the measurable goals for each Minimum Control Measure in the following sections.

7.1 Public Education and Outreach

The goal of this minimum control measure is to develop and distribute educational materials and perform outreach to inform residents, students, contractors, business owners and onsite civilian and military personnel about the impact of polluted storm water runoff discharges, and how their actions impact water quality at Fort Leonard Wood.

To satisfy this minimum control measure, the operator of a regulated small MS4 needs to:

- Implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on local water bodies and the steps the public can take to reduce pollutants in storm water runoff;
- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. The program implementation schedule, BMPs and measurable goals are detailed in the following BMP Summary Tables.

7.1.1 BMP # 1A: Implement a Stormwater Program

BMP Title: Implement a Storm Water Education Program

Permit Section(s) Compliance Reference: 4.2.1.1

BMP Description:

The public at Fort Leonard Wood (FLW) is a community made up of residents, students, contractors, business owners, and both military and civilian personnel. As such, public education will aim at raising community awareness of storm water pollution, the impact of FLW operations on storm water and the BMPs implemented on site to reduce these impacts. FLW plans to establish a 5-year Stormwater Education Program during the first year of the reporting cycle. Specific input from the public SWMP meetings, meetings with business and educational professionals, along with information obtained from the educational material distribution surveys will be used to determine specific activities for the program, considering budget, manpower and resources. (See below measurable goals for more detailed information.)

The Directorate of Public Works, Environmental Compliance Branch will coordinate these programs by targeting each audience, facilitating development or adaptation of appropriate educational materials and addressing distribution of the materials.

Measurable Goals/ (Implementation Timeline):

I: Civilian / Military Personnel Education

- 1) Identify civilian/ military personnel groups impacted and targeted pollution sources to address (*Year 1*)
- 2) Identify and/or develop training materials for Pollution Prevention/Good Housekeeping, in accordance with BMP 6B. (*Developed years 1-2, revisions and additions implemented years 3-5*)
- 3) Conduct training for impacted personnel regarding stormwater pollution prevention (*Begin during year 1, continuing throughout years 2-5*)
- 4) Evaluate and revise educational materials as necessary to ensure compliance with Minimum Control Measure 6 (*Ongoing process throughout the five year implementation schedule*)

II: Resident Education

- 1) Identify targeted pollutant sources to focus educational messages for residents (*Initial list developed in Year 1, to be prioritized and revised throughout years 2-5*)
- 2) Identify and/or develop educational campaigns, brochures, and/or public workshops (*Developed to coincide with targeted pollutant sources list in Year 1, continuing implementation throughout years 2-5*)
- 3) Evaluate effectiveness of campaigns, potentially through resident surveys and participation levels at FLW sponsored storm water pollution prevention events (*Ongoing throughout years 1-5*)

III: Student Education

- 1) Identify targeted pollutant sources to focus educational messages for students (*Initial list developed in Year 1, to be prioritized and revised throughout years 2-5*)
- 2) Develop and/or adapt existing classroom curriculum for storm water pollution prevention (*Years 1-2*)
- 3) Potentially develop a rewards program for students and teachers that participate in public storm water pollution prevention activities around FLW (*Years 2-3, if identified as a viable program*)
- 4) Evaluate effectiveness of classroom education, potentially through testing and/or student participation levels in storm water pollution prevention activities (*Ongoing throughout years 1-5*)

IV: Contractor Education

- 1) Initial training/review to include erosion and sediment control requirements, impacts to water quality, BMPs, and inspection and enforcement procedures (*Year 1*)
- 2) Erosion and sediment control trainings will be conducted for all audiences as needed (ex. new projects)

- or new personnel, refresher courses) (*Ongoing throughout Years 1-5*)
- 3) Develop procedure for public reporting of erosion and sediment problems (*Years 2-3*)
- 4) Annual review of inspection checklists, records, and enforcement action to determine effectiveness of training on specific audiences (*Years 1-5*)

V: Business Education

- 1) Identify businesses at FLW impacted for each Minimum Control Measure (*Year 1*)
- 2) Develop and/or adapt educational campaigns, brochures, and/or public workshop series for businesses regarding pollution prevention and storm water management (*Ongoing years 1-5*)
- 3) Potentially develop a Green Partners program for businesses at FLW to encourage best management practices for stormwater and other resource protection activities (*Years 2-3, if determined feasible*)
- 4) Conduct trainings and certification workshops for the Green Partners program, if program is implemented (*Years 3-4, if program is determined feasible*)
- 5) Evaluate effectiveness of business education through methods such as surveys, participation in FLW sponsored storm water pollution prevention events, and other methods not yet determined (*Ongoing*)

Specific Components and Notes:

Three main action areas for successful public education programs have been identified and will serve as the foundation for implementing the FLW Storm Water Education Program:

- Forming Partnerships/Relationships with Target Audiences
- Using Available Educational Materials and Strategies
- Reaching Diverse Audiences

Responsible Party for this BMP:

Directorate of Public Works
 Environmental Division, MS4 Program Manager
 Phone: 573-596-0882

7.1.2 BMP # 1B: Distribute Education Materials

BMP Title: Distribute Education Materials

Permit Section(s) Compliance Reference: 4.2.1.1.5

BMP Description:

Distribution of educational materials may be through information tables at community events, electronic distributions via email, websites, and internal publications including FLW newsletters, staff bulletins, and newsletters aimed both at the general community and targeted audiences. In addition, educational materials may be presented in person to a variety of audiences from environmental classes to key administrators and operations with direct impacts on storm water.

Measurable Goals/ (Implementation Timeline):

- 1) Complete survey of existing educational materials already developed by federal, state, and local organizations in relation to identified target pollutant sources and compile inventory list for distribution materials (*Year 1 and ongoing throughout years 2-5*)
- 2) Determine the target audiences and best distribution route for each targeted pollution source's educational materials (*Year 1, ongoing throughout years 2-5*)
- 3) Distribute selected pollutant source reduction materials to target audiences through identified distribution methods (*Ongoing throughout years 1-5*)

Specific Components and Notes:

Distribution material topics may include:

<ul style="list-style-type: none"> • Identified targeted pollution sources such as (environmental lawn care practices, rain gardens, pet waste management, native plants, and pesticide management) • Volunteer opportunities (ex: trash pickup, stream monitoring, storm drain stenciling, etc) • Public meeting notice information • Public awareness of storm water related issues
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.1.3 BMP # 1C: Evaluate Success of Stormwater Education Program

<p>BMP Title: Evaluate Success of Stormwater Education Program</p>
<p>Permit Section(s) Compliance Reference: 4.2.1.1.6</p>
<p>BMP Description: As part of the permit requirements, FLW must evaluate the success of each minimum control measure. The success of the Public Education and Outreach Measure will mainly be measured through responses from each targeted audience with regard to the pollutant source reduction practice educational efforts. For example, behavioral changes, positive responses to surveys, attendance at various educational events, and adherence to policies and procedures will all be results indicating a successful education and outreach effort.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Conduct post-educational event and/or campaign response mechanism (ex. survey) for each targeted audience intended. (<i>Ongoing, Years 1-5</i>) 2) Monitor adherence to policies and procedure compliance (ex. pollution prevention/good housekeeping practices within the installation). (<i>Ongoing, Years 1-5</i>) 3) Track participation levels at FLW stormwater related meetings, events, survey responses, etc to determine whether target audiences are being reached and responding. (<i>Ongoing, Years 1-5</i>)
<p>Specific Components and Notes:</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.2 Public Involvement/Participation

The goal of this minimum control measure is to provide opportunities for residents, students, contractors, and onsite civilian and military personnel to participate in program development and implementation of the storm water management plan.

To satisfy this minimum control measure, the operator of a regulated small MS4 must:

- Implement a public involvement/participation program that complies with State and local public notice requirements, and involve the public in the development and oversight of the Storm Water Pollution Prevention Plan, policies, and procedures;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

A summary of each identified BMP for this Minimum Control Measure is listed below:

7.2.1 BMP # 2A: Comply with Public Notice Requirements

BMP Title: Comply with Public Notice Requirements
Permit Section(s) Compliance Reference: 4.2.2.1
<p>BMP Description: FLW already complies with all required public notice requirements. This practice will continue and will be administered for all storm water public meetings for the SWMP to discuss provisions, effectiveness, or amendments.</p> <p>Public notices regarding storm water activities and events may be delivered to targeted audiences in a variety of formats as appropriate, determined by the Stormwater Education Program, to ensure a diverse group of participants.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Issue public notices for all public meetings related to the SWMP (<i>Years 1-5</i>) 2) Notify targeted audiences through various distribution methods to increase participation for public meetings, storm water activities and events (<i>Years 1-5</i>) 3) Placement of SWMP in a location that has public access (ex: website, local library) (<i>Ongoing years 1-5</i>)
<p>Specific Components and Notes: All required and pertinent information will be included in all public notices (such as date, time, location, etc). Additionally, all public notices and SWMP documents will remain on file in a public accessible location for the duration of the permit.</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.2.2 BMP # 2B: Solicit Public Input and Opinion on the SWMP

BMP Title: Solicit Public Input and Opinion on the SWMP
Permit Section(s) Compliance Reference: 4.2.2.1.1
<p>BMP Description: FLW will solicit direct comment from the community about the effectiveness of the SWMP and the implementation of the BMPs outlined in the plan as appropriate or, at a minimum, on an annual basis. The FLW Garrison hosts a monthly information forum called 'Woodworks' for the installation community to discuss a variety of topics, including issues such as stormwater management. Additionally, the FLW Commanding General conducts two 'Town Hall' meetings each year to discuss FLW operations. In addition to the above existing public forum opportunities, the Environmental Division hosts a variety of public events throughout the year, such as the annual Earth Day celebration, that can be utilized to solicit public input and provide SWMP information. The above mentioned venues will provide a variety of opportunities to solicit input from the community throughout the year.</p> <p>In addition to the public forums, public comment on the BMPs may be solicited through public surveys and at storm water events as appropriate.</p>

<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Participation numbers from SWMP related forums, meetings and events (<i>Ongoing, Years 1-5</i>) 2) Results from surveys (if appropriate) for effectiveness of educational campaigns to targeted audiences (<i>Ongoing, Years 1-5</i>) 3) Accessibility of SWMP information, including the use of FLW Website, newsletter articles, and events (<i>Ongoing, Years 1-5</i>)
<p>Responsible Party for this BMP:</p> <p>Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.2.3 BMP # 2C: Identify and Establish Volunteer Opportunities for SWPP Activities

<p>BMP Title: Identify and Establish Volunteer Opportunities for Storm Water Pollution Prevention Activities</p>
<p>Permit Section(s) Compliance Reference: 4.2.2.1.3 - 4.2.2.1.4</p>
<p>BMP Description:</p> <p>FLW will establish a 5-year Stormwater Education Program during the first year of the reporting cycle. Specific input from the public SWMP forums, meetings with business and educational professionals, along with information obtained from the educational material distribution surveys may be used to determine specific activities for the program, considering budget, manpower and resources.</p> <p>In an effort to engage a diverse cross-section of people that can offer a multitude of concerns, ideas, and assistance with implementation of the BMPs outlined in the Storm Water Education Program, FLW will identify and establish a variety of volunteer opportunities for Storm Water Pollution Prevention activities. Activities included as part of this BMP will be selected based on educational targeted messages identified as part of the Storm Water Education Program.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Number of FLW supported opportunities identified and implemented for volunteers; such as community clean-ups, water quality monitoring, citizen watch groups, citizen panels, MO Stream Team formation, etc. (<i>Ongoing, Years 1-5</i>) 2) Number of volunteers participating in FLW supported Storm Water Pollution Prevention activities (<i>Ongoing, Years 1-5</i>) <p>See also BMP #1A Storm Water Education Program measurable goals.</p>
<p>Specific Components and Notes:</p> <p>Volunteer opportunities will be supported in conjunction with the Storm Water Education Program (BMP 1A).</p>
<p>Responsible Party for this BMP:</p> <p>Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.2.4 BMP # 2D: Evaluate Success of Public Involvement/Participation Activities

<p>BMP Title: Evaluate Success of Public Involvement/Participation Activities</p>
<p>Permit Section(s) Compliance Reference: 4.2.2.1.5</p>
<p>BMP Description:</p> <p>As part of the permit requirements, FLW must evaluate the success of each minimum control measure. The</p>

<p>success of the Public Involvement/Participation Measure will mainly be measured through interest and participation levels from each targeted audience with regard to the stormwater related meetings, events, trainings, workshops, etc.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <p>1) Track participation levels at FLW stormwater related meetings, events, etc to determine whether target audiences are being reached and responding. (<i>Ongoing, Years 1-5</i>)</p>
<p>Specific Components and Notes:</p>
<p>Responsible Party for this BMP:</p> <p>Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.3 Illicit Discharge Detection and Elimination

The goal of this minimum control measure is to develop and implement a plan to detect and eliminate non-storm water discharges (illicit discharges) such as process water, wash water, chemical spills, and other non-rain water discharges to the storm drain system. Only clean rainwater should be discharged to the storm drain system.

Recognizing the adverse effects illicit discharges can have on receiving waters, regulated small MS4 communities must develop, implement, and enforce an illicit discharge detection and elimination program. This program must include the following:

- A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;
- Through internal policies and procedures, a prohibition (to the extent allowable under State or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions;
- A plan to detect and address non-storm water discharges, including illegal dumping, into the municipal separate storm sewer system;
- The education of civilian and military personnel, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste;
- The determination of appropriate BMPs and measurable goals for this minimum control measure.

Allowable Non-Storm Water Discharges

The illicit discharge detection and elimination program does not need to address the following categories of non-storm water discharges or flows unless the operator of the regulated small MS4 identifies them as significant contributors of pollutants to its MS4. Unless otherwise noted, the determination by Fort Leonard Wood in relation to each of the potentially allowable non-storm water discharges identified below is 'not a significant contributor of pollution discharges':

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration
- Uncontaminated pumped ground water

- Discharges from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Street wash water

A summary of each identified BMP for this Minimum Control Measure is listed below:

7.3.1 BMP # 3A: Storm Sewer System Map

BMP Title: Storm Sewer System Map
Permit Section(s) Compliance Reference: 4.2.3.1.1
<p>BMP Description: FLW will develop an installation storm sewer system inventory map and update as required. The map will contain the following, as appropriate:</p> <ul style="list-style-type: none"> • Ponds, sediment basins and wetlands that are part of the system • Structural pollution control devices (such as grit chambers, separators, etc.) onsite • Pipes and conveyances that are in the system (at least those 24 inches in diameter or larger) • Outfalls (to include): <ul style="list-style-type: none"> ○ discharges from the FLW system into other MS4s ○ discharges from the FLW system into waters (streams and lakes) / wetlands ○ points of discharge that are outlets (pipes and ditches), not diffuse flow areas
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Complete storm sewer system inventory and inspection map. (<i>Year 1</i>). 2) Establish process (i.e. Illicit Discharge Detection and Elimination Plan) to locate and map known outfalls. (<i>Years 1</i>) 3) Establish process to locate and map known ponds and structural pollution control devices. (<i>Years 1</i>) 4) Establish and document a protocol for visual screenings, training for inspectors, and procedures for further investigation of illicit discharges such as monitoring, clean up, and enforcement (<i>Year 1</i>) 5) Conduct training for appropriate personnel for locating structural pollution control devices, outfalls, and other system parameters (<i>Year 2, Ongoing as needed</i>) 6) Visual screening at all outfalls over the life of the permit, with minimum of 25% of total area under MS4 screened annually to meet 100% screening requirement by end of 5-year permit cycle (<i>Years 2-5</i>) 7) Update storm sewer system map (<i>Ongoing throughout Years 2-5, as needed</i>)
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.3.2 BMP # 3B: Regulatory Control and Enforcement Program

BMP Title: Regulatory Control and Enforcement Program

Permit Section(s) Compliance Reference: 4.2.3.1.2; 4.2.3.1.3.4; 4.2.3.1.6

BMP Description:

FLW will develop an illicit discharge reporting procedure, possibly in the form of a flow chart to be used as part of the procedure for controlling illicit discharges. The reporting procedure will provide direction on who to call (and the order to call them) when an illicit discharge is suspected. This procedure will closely follow the installation's 'Spill Prevention and Response Plan' established in August 2007, which outlines reporting responsibilities for petroleum or hazardous waste spills.

Fort Leonard Wood is a Department of Army Federal military installation and must abide by specific requirements not applicable to municipalities. Fort Leonard Wood has three primary types of entities: Government, Contracted, and Privatized, each requiring separate enforcement mechanisms due to differences in the legal relationships. Army environmental regulations require Government entities to comply with Federal and State environmental laws and regulations. Fort Leonard Wood will continue to include language in contracts and privatized agreements requiring compliance with Federal and State environmental laws and regulations. A sample of the standard contract language is available upon request.

A summary of violations and enforcement actions will be submitted with annual reporting requirements of the MS4 Permit.

A four-level Continuum of Enforcement consisting of a Verbal Warning, a Letter of Warning, a Notice of Non-Compliance, and Regulatory Notification. The following provides greater detail regarding the Continuum of Enforcement for storm water quality, with subsections for each entity. This protocol uses the standard Federal Government business work days, Monday through Friday. Weekends and the ten Federal Holidays are not considered business days.

- 1) **Verbal Warning:** For Government tenants, contractors/concessionaires, and privatized activities: Verbal Warnings and informal notice for corrective action from Fort Leonard Wood. A Verbal Warning to be issued for conditions which are in violation and are under the control of the third party. Issuing office will be not lower than the DPW Environmental Office. The noticed party has seven business days from delivery, counting from and including the day of receipt, to take required corrective action and respond to the notice;
- 2) **Letter of Warning:** A Letter of Warning noting the violation, to be signed by Fort Leonard Wood, where the third party's activities represent a violation which are less immediate but represent greater gravity of consequences than would be appropriate for a Verbal Warning, or if the third party has not responded to the Verbal Warning. Issuing office will be not lower than the DPW Director's Office. The noticed party has seven business days from delivery, counting from and including the day of receipt, to take required corrective action and respond to the notice:

Government tenants – Failure to immediately commence corrective actions may result in a prohibition on activities directly contributing to the Violation at that site, except for corrective actions, up to and including a work stoppage at the site. A copy of the Letter of Warning will be provided to the next higher level of the agency or activity involved.

Government contractors/concessionaires - Failure to immediately commence corrective action of the violation may result in sanctions, through the administering Contract Officer. Sanctions may include but not limited to stop work orders, Notice to Cure, and adverse determinations on incentive performance award fees. A copy of the Letter of Warning will be provided to the Contracting Office responsible for award and administration of the contract involved.

Privatized entities - Failure to immediately commence corrective action will result in a Letter of Warning with a copy to the Federal agency responsible for administering the operating agreement with the privatized entity, and may result in initiation of action to bar culpable individuals from entry onto the military installation. A copy of the Letter of Warning will be provided to the next higher level of corporate management off the installation if applicable.

- 3) Notice of Non-Compliance:** A Notice of Non-Compliance will be issued to third parties informing all categories of individuals and organizations listed below of possible civil and/or criminal liability for the violation. The issuing officer will be the Deputy Garrison Commander, The noticed party of any category listed below has seven business days from delivery, counting from and including the day of receipt, to take corrective action and respond to the notice. In addition to the general provisions applicable to all types of parties listed in this paragraph, the additional information and measures below, including if the third party has not responded to the Verbal Warning or Letter of Warning, apply to particular types of parties involved:

Government tenants – Immediate cessation of the non-compliant conduct. Immediate initiation of corrective actions, impose appropriate limitations up to and including immediate prohibition of further non-corrective activities, or work stoppage at the project site until resolved. Formal investigations for misconduct or culpable negligence on the part of responsible individuals from the activity involved, ultimately to develop recommended means to prevent recurrence and to develop evidence supporting adverse administrative personnel actions on responsible military or civilian personnel, and/or Uniform Code of Military Justice disciplinary actions against responsible military personnel.

Government contractors/concessionaires - Immediate cessation of the non-compliant conduct. Immediate initiation of corrective, impose appropriate limitations up to and including immediate prohibition of further non-corrective activities, or work stoppage at the project site until resolved, if indicated. Failure to obey and commence corrective action may result in contractual sanctions through the administering contract officer, including but not limited to stop work orders, Contract Termination for Default, adverse determinations on incentive performance award fees, withholding of progress payments, and possible pursuit of debarment of individuals or entities from eligibility for Government contracts in cases raising fraud, waste, or abuse issues, and any other contractual remedy afforded under the Federal Acquisition Regulations or applicable supplements. A copy of the Notice of Non-Compliance will be provided to the responsible contracting office awarding and administering the contract involved, informing individuals and organizations of possible civil and/or criminal liability for violation. Potential contractual sanctions include but are not limited to pass-through of any monetary assessments by regulators and ineligibility of same for any reimbursement by the Government, as well as notice delivered through the permittee's contract administrator of possible assertion of additional contract claims for consequential damages, costs, sureties, etc. to mitigate and restore the effects of such violations, based on the terms of the contract involved. Time deadlines for contract remedies are those required by the Federal Acquisition Regulations, the particular contract terms involved, and case law of the

contract adjudicative forum (Generally the Armed Services Board of Contract Appeals) as made and provided, and under which the permittee must operate, which are acknowledged to generally be significantly longer than the seven calendar days to be afforded for the purposes of permit compliance.

Privatized entities - Immediate cessation of the non-compliant conduct. Immediate initiation of corrective actions, immediate prohibition of further non-corrective activities, or work stoppage at the specific project site until resolved, if indicated. Notice to the administering agency responsible for administering the operating agreement with the privatized entity. Copies of the notice will also be provided to the next higher level of corporate management of the entity off the installation, if applicable, and at least one step above any level of management apparently implicated in the violation. Further action by the installation may include initiation of action to bar any culpable individuals from entry onto the military reservation.

- 4) Regulatory Notification:** Failure to respond to the Notice of Non-Compliance or violations which cannot be enforced in a timely manner will be promptly reported to the regulatory agencies with civil enforcement powers able to issue a formal Notice of Violation and assess damages, penalties, fines, and other punitive or remedial consequences at the regulator’s discretion. A copy of the regulatory notification will be provided the higher level of authority or management, and to the administering office, as applicable. Activities will bear the burden of restitution for any damages, penalties, fines or punitive consequences levied to Fort Leonard Wood regardless whether the regulatory agency issues similar to the third party.

Repeated offenses or a pattern of poor compliance, can also lead to bypassing the first, informal notice level and moving the issue straight into the second level (Letter of Warning) if the pattern is deemed to be a possible indicator of bad faith or demonstrate an unwilling or defiant approach to inspection, regulation, and compliance.

Measurable Goals/ (Implementation Timeline):

- 1) Creation of illicit discharge reporting procedure (ex. contact flow chart). *(Year 1)*
- 2) Identification and reporting process established for enforcement actions. *(Year 1)*
- 3) Implementation of illicit discharge reporting procedure. *(Ongoing throughout Years 1-5)*

Specific Components and Notes:

Refer to BMP 1A for educational components related to this minimum control measure.

Responsible Party for this BMP:

Directorate of Public Works
 Environmental Division, MS4 Program Manager
 Phone: 573-596-0882

7.3.3 BMP # 3C: Illicit Discharge Detection and Elimination Plan

BMP Title: Illicit Discharge Detection and Elimination Plan

Permit Section(s) Compliance Reference: 4.2.3.1.3.1

BMP Description:

Develop a program to detect and eliminate illegal and/or improper connections to storm drainage system and receiving waters. Specific illicit discharge connections will be identified by FLW personnel or contractors over the 5 years of the implementation schedule using specific components listed below. After detection of illicit discharge locations, FLW will identify appropriate enforcement procedures and make appropriate contacts to outside agencies as needed.

<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Complete list of existing information on illicit connection tests performed to date <i>(Year 1)</i> 2) Maintain records of illicit discharges identified, enforcement, and corrective actions <i>(Years 1-5)</i> 3) Development of a reporting procedure (ex. contacts flow chart). <i>(Year 1)</i> 4) Trainings for staff/targeted audiences for illicit discharge detection. <i>(Years 2-3)</i> 5) Conduct field tests for illicit discharge and connections for existing storm system. <i>(Years 2-3)</i> 6) Maintain records of illicit discharges identified, enforcement and correction actions. <i>(Ongoing, Years 1-5)</i>
<p>Specific Components and Notes: Refer to BMP 1A for educational components related to this minimum control measures</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.3.4 BMP # 3D: Identification of Non-Storm Water Discharges and Flows

<p>BMP Title: Identification of Non-Storm Water Discharges and Flows</p>
<p>Permit Section(s) Compliance Reference: 4.2.3.1.3; 4.2.3.1.4 - 4.2.3.1.5</p>
<p>BMP Description: FLW will determine whether any of the following categories of non-stormwater discharges or flows are significant contributors of pollutants to the stormwater system: uncontaminated ground water infiltration, irrigation water, springs, flows from riparian habitats and wetlands and structure washing water. For any non-stormwater discharges or flows identified to be a significant contributor of pollutants to the MS4, FLW will develop a standard operating procedure to address the impact the discharge is having on stormwater quality.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Conduct investigation and evaluation of non-stormwater discharges and flows. <i>(Years 1-2)</i> 2) Develop a standard operating procedure to address the impact any non-stormwater discharges or flows identified as significant contributors of pollutants to the system. <i>(Years 1-2)</i> 3) Implement the standard operating procedure for significant non-stormwater discharges and flows <i>(Years 3-5)</i>
<p>Specific Components and Notes: Refer to BMP 1A for educational components related to this minimum control measures</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.3.5 BMP # 3E: Evaluate the Illicit Discharge Detection and Elimination Program

<p>BMP Title: Evaluate the Illicit Discharge Detection and Elimination Program</p>
<p>Permit Section(s) Compliance Reference: 4.2.3.1.6</p>
<p>BMP Description: As part of the permit requirements, FLW must evaluate the success of each minimum control measure. The success of the Illicit Discharge Detection and Elimination Measure will mainly be measured through the completion of the measurable goals outlined in each of the identified BMPs, which address the detection, reporting, enforcement, and elimination of illicit discharges into the installation's stormwater system.</p>
<p>Measurable Goals/ (Implementation Timeline):</p>

1) Monitor completion of measurable goals outlined in BMPs 3A-3D. <i>(Ongoing, Years 1-5)</i>
2) Decrease in the number of illicit discharges into the installations stormwater system. <i>(Ongoing, Years 1-5)</i>
Specific Components and Notes:
Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882

7.4 Construction Site Storm Water Runoff Control

The goal of this minimum control measure is to develop, implement, and enforce an erosion and sediment control program for construction activities.

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre shall be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The small MS4 operator is required to:

- Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites;
- Have formal procedures for site plan review of construction plans that consider potential water quality impacts;
- Have formal procedures for site inspection and enforcement of control measures;
- Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);
- Establish formal procedures for the receipt and consideration of information submitted by the public;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

A summary of each identified BMP for this Minimum Control Measure is listed below:

7.4.1 BMP # 4A: Regulatory Mechanism and Enforcement Procedures

BMP Title: Regulatory Mechanism and Enforcement Procedures
Permit Section(s) Compliance Reference: 4.2.4.1.1; 4.2.4.1.1.2; 4.2.4.1.1.3; 4.2.4.1.6
Fort Leonard Wood is a Department of Army Federal military installation and must abide by specific requirements not applicable to municipalities. Fort Leonard Wood has three primary types of entities: Government, Contracted, and Privatized, each requiring separate enforcement mechanisms due to differences in the legal relationships. Army environmental regulations require Government entities to comply with Federal and State environmental laws and regulations. Fort Leonard Wood will continue to include language in contracts and privatized agreements requiring compliance with Federal and State environmental laws and regulations. A sample of the standard contract language is available upon request.

A summary of violations and enforcement actions will be submitted with annual reporting requirements of the MS4 Permit.

A four-level Continuum of Enforcement consisting of a Verbal Warning, a Letter of Warning, a Notice of Non-Compliance, and Regulatory Notification. The following provides greater detail regarding the Continuum of Enforcement for storm water quality, with subsections for each entity. This protocol uses the standard Federal Government business work days, Monday through Friday. Weekends and the ten Federal Holidays are not considered business days.

- 1) **Verbal Warning:** For Government tenants, contractors/concessionaires, and privatized activities: Verbal Warnings and informal notice for corrective action from Fort Leonard Wood. A Verbal Warning to be issued for conditions which are in violation and are under the control of the third party. Issuing office will be not lower than the DPW Environmental Office. The noticed party has seven business days from delivery, counting from and including the day of receipt, to take required corrective action and respond to the notice;
- 2) **Letter of Warning:** A Letter of Warning noting the violation, to be signed by Fort Leonard Wood, where the third party's activities represent a violation which are less immediate but represent greater gravity of consequences than would be appropriate for a Verbal Warning, or if the third party has not responded to the Verbal Warning. Issuing office will be not lower than the DPW Director's Office. The noticed party has seven business days from delivery, counting from and including the day of receipt, to take required corrective action and respond to the notice:

Government tenants – Failure to immediately commence corrective actions may result in a prohibition on activities directly contributing to the Violation at that site, except for corrective actions, up to and including a work stoppage at the site. A copy of the Letter of Warning will be provided to the next higher level of the agency or activity involved.

Government contractors/concessionaires - Failure to immediately commence corrective action of the violation may result in sanctions, through the administering Contract Officer. Sanctions may include but not limited to stop work orders, Notice to Cure, and adverse determinations on incentive performance award fees. A copy of the Letter of Warning will be provided to the Contracting Office responsible for award and administration of the contract involved.

Privatized entities - Failure to immediately commence corrective action will result in a Letter of Warning with a copy to the Federal agency responsible for administering the operating agreement with the privatized entity, and may result in initiation of action to bar culpable individuals from entry onto the military installation. A copy of the Letter of Warning will be provided to the next higher level of corporate management off the installation if applicable.

- 3) **Notice of Non-Compliance:** A Notice of Non-Compliance will be issued to third parties informing all categories of individuals and organizations listed below of possible civil and/or criminal liability for the violation. The issuing officer will be the Deputy Garrison Commander, The noticed party of any category listed below has seven business days from delivery, counting from and including the day of receipt, to take corrective action and respond to the notice. In addition to the general provisions applicable to all types of parties listed in this paragraph, the additional information and measures below, including if the third party has

not responded to the Verbal Warning or Letter of Warning, apply to particular types of parties involved:

Government tenants – Immediate cessation of the non-compliant conduct. Immediate initiation of corrective actions, impose appropriate limitations up to and including immediate prohibition of further non-corrective activities, or work stoppage at the project site until resolved. Formal investigations for misconduct or culpable negligence on the part of responsible individuals from the activity involved, ultimately to develop recommended means to prevent recurrence and to develop evidence supporting adverse administrative personnel actions on responsible military or civilian personnel, and/or Uniform Code of Military Justice disciplinary actions against responsible military personnel.

Government contractors/concessionaires - Immediate cessation of the non-compliant conduct. Immediate initiation of corrective, impose appropriate limitations up to and including immediate prohibition of further non-corrective activities, or work stoppage at the project site until resolved, if indicated. Failure to obey and commence corrective action may result in contractual sanctions through the administering contract officer, including but not limited to stop work orders, Contract Termination for Default, adverse determinations on incentive performance award fees, withholding of progress payments, and possible pursuit of debarment of individuals or entities from eligibility for Government contracts in cases raising fraud, waste, or abuse issues, and any other contractual remedy afforded under the Federal Acquisition Regulations or applicable supplements. A copy of the Notice of Non-Compliance will be provided to the responsible contracting office awarding and administering the contract involved, informing individuals and organizations of possible civil and/or criminal liability for violation. Potential contractual sanctions include but are not limited to pass-through of any monetary assessments by regulators and ineligibility of same for any reimbursement by the Government, as well as notice delivered through the permittee's contract administrator of possible assertion of additional contract claims for consequential damages, costs, sureties, etc. to mitigate and restore the effects of such violations, based on the terms of the contract involved. Time deadlines for contract remedies are those required by the Federal Acquisition Regulations, the particular contract terms involved, and case law of the contract adjudicative forum (Generally the Armed Services Board of Contract Appeals) as made and provided, and under which the permittee must operate, which are acknowledged to generally be significantly longer than the seven calendar days to be afforded for the purposes of permit compliance.

Privatized entities - Immediate cessation of the non-compliant conduct. Immediate initiation of corrective actions, immediate prohibition of further non-corrective activities, or work stoppage at the specific project site until resolved, if indicated. Notice to the administering agency responsible for administering the operating agreement with the privatized entity. Copies of the notice will also be provided to the next higher level of corporate management of the entity off the installation, if applicable, and at least one step above any level of management apparently implicated in the violation. Further action by the installation may include initiation of action to bar any culpable individuals from entry onto the military reservation.

- 4) **Regulatory Notification:** Failure to respond to the Notice of Non-Compliance or violations which cannot be enforced in a timely manner will be promptly reported to the regulatory agencies with civil enforcement powers able to issue a formal Notice of Violation and assess damages, penalties, fines, and other punitive or remedial consequences at the regulator's discretion. A copy of the regulatory notification will be provided the higher level of authority or management, and to the administering office, as applicable. Activities will bear the burden of restitution for any damages, penalties, fines or punitive consequences levied to Fort Leonard

<p>Wood regardless whether the regulatory agency issues similar to the third party.</p> <p>Repeated offenses or a pattern of poor compliance, can also lead to bypassing the first, informal notice level and moving the issue straight into the second level (Letter of Warning) if the pattern is deemed to be a possible indicator of bad faith or demonstrate an unwilling or defiant approach to inspection, regulation, and compliance.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Complete evaluation of existing SWPPP in relation to the six minimum control measures. <i>(Year 2)</i> 2) Amend SWPPP, if necessary, to comply with MS4 permit conditions. <i>(Years 2-3)</i> 3) Implement administrative procedures/policies regarding the SWPPP, document inspections and enforcement procedures. <i>(Ongoing, Years 2-5)</i>
<p>Specific Components and Notes:</p> <ul style="list-style-type: none"> • Refer to BMP 1A for educational components related to this minimum control measure • Ensure all installation construction projects with one or more acres of soil impact address erosion and sediment control according to the SWPPP
<p>Responsible Party for this BMP:</p> <p>Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.4.2 BMP # 4B: Construction Site Implementation of Erosion and Sediment Control BMPs

<p>BMP Title: Construction Site Implementation of Erosion and Sediment Control BMPs</p>
<p>Permit Section(s) Compliance Reference: 4.2.4.1.1.1</p>
<p>BMP Description:</p> <p>According to FLW's MSOP MO-0117251, all construction activities on FLW are to follow the installation's 'Storm Water Pollution Prevention Plan' (SWPPP), regardless of project size. The SWPPP addresses erosion and sediment control BMPs in Section D: A List of Procedures to Prevent and/or Correct Erosion or Pollution of the Environment. Specific BMPs regarding sediment control are listed in Section D, Section 7 of the SWPPP.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Create a tracking system (ex. database) that maintains records of all construction site operators' approved permits and BMPs implemented onsite. <i>(Year 1)</i> 2) Complete Site Plan Reviews to ensure compliance with SWPPP. <i>(Ongoing, Years 1-5)</i> 3) Maintain records of ongoing site inspections and enforcement actions for sediment and erosion control practices implemented onsite. <i>(Ongoing, Years 1-5)</i>
<p>Specific Components and Notes:</p> <p>Refer to BMP 1A for educational components related to this minimum control measures</p>
<p>Responsible Party for this BMP:</p> <p>Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.4.3 BMP # 4C: Waste Controls for Construction Site Operators

<p>BMP Title: Waste Controls for Construction Site Operators</p>
<p>Permit Section(s) Compliance Reference: 4.2.4.1.2</p>
<p>BMP Description:</p>

<p>According to FLW's MSOP MO-0117251, all construction activities on FLW are to follow the installation's 'Storm Water Pollution Prevention Plan' (SWPPP), regardless of project size. The SWPPP includes sections for Storm Water Runoff Pollution Prevention, Erosion and Sediment Control, and Spill Control and Countermeasures. The SWPPP's 'Section C: Examples of Areas/Resources That Must Be Protected, Monitoring and Weekly Inspections Requirements, and Related Management Concerns' specifically addresses the management of post-construction cleanup and oily wastes, among a variety of other considerations. Additionally, 'Section E: Requirements for Solid Waste Disposal' further specifies waste controls for construction activities on FLW.</p> <p>The specifications outlined in the installation's SWPPP will be evaluated in relation to the six minimum control measures and changes considered as necessary for additional needed waste controls.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Maintain records of all construction site operator's approved permits and BMPs. (<i>Ongoing, Years 1-5</i>) 2) Evaluate existing SWPPP in relation to the six minimum control measures and make necessary amendments for compliance with increased construction waste controls, if appropriate. (<i>Years 1-2</i>) 3) Inspect projects on FLW for construction waste control BMPs on a routinely scheduled basis, potentially integrated with erosion and sediment control inspection process. (<i>Years 2-5</i>)
<p>Specific Components and Notes: Refer to BMP 1A for educational components related to this minimum control measures</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.4.4 BMP # 4D: Procedure for Site Plan Reviews

<p>BMP Title: Procedure for Site Plan Reviews</p>
<p>Permit Section(s) Compliance Reference: 4.2.4.1.3</p>
<p>BMP Description: The FLW Directorate of Public Works, Environmental Division currently reviews and approves all individual Stormwater Pollution Prevention Plans (SWPPP) for construction sites greater than 1 acre for compliance with the National Environmental Policy Act (NEPA) considerations.</p> <p>FLW will evaluate the current site review process for compliance under the MS4 permit conditions. To assist in the site review process, FLW may develop a checklist for reviewing site plans. Additionally, the current process will be evaluated to determine whether all projects, including sites less than one acre of disturbance, need to be included in the review process.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Continue site reviews for projects greater than one acre of land disturbance. (<i>Ongoing, Years 1-5</i>) 2) Review of current site review process and identification of policy changes, if needed. (<i>Years 1-2</i>) 3) If determined appropriate, develop storm water project submittal checklist for storm water management and compliance with MS4 permit conditions for use during site review. (<i>Years 2-3</i>)
<p>Specific Components and Notes: Refer to BMP 1A for educational components related to this minimum control measures</p>
<p>Responsible Party for this BMP: Directorate of Public Works</p>

Environmental Division, MS4 Program Manager
 Phone: 573-596-0882

7.4.5 BMP # 4E: Establishment of Procedures for Receipt and Consideration of Noncompliance

BMP Title: Establishment of Procedures for the Receipt and Consideration of Noncompliance
Permit Section(s) Compliance Reference: 4.2.4.1.4
<p>BMP Description: All construction activities on FLW are to follow the installation’s ‘Storm Water Pollution Prevention Plan’ (SWPPP), which includes sections for Storm Water Runoff Pollution Prevention, Erosion and Sediment Control, and Spill Control and Countermeasures. The SWPPP’s ‘Section D: A List of Procedures to Prevent and/or Correct Erosion or Pollution of the Environment’ specifically addresses the notification process for permittee noncompliance.</p> <p>Additional required activities for this BMP include:</p> <ul style="list-style-type: none"> • Establish policy and procedures to gather reports of non-compliance from all installation construction inspections • Establish procedures to gather information from citizens and others who wish to report complaints concerning construction site activities • Establish procedures to report noncompliance to agency authorities when appropriate • Develop record keeping programs to maintain complaint and inspection reports
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Create a SWPPP report mechanism (ex: phone line, webpage form) for public to report construction site complaints. <i>(Year 1)</i> 2) Create policy and procedures to track complaint reports from all installation construction site SWPPP non-compliance. <i>(Years 1-2)</i> 3) Create procedures to track information from construction site inspections and enforcement actions. <i>(Years 1-2)</i> 4) Maintain records for all inspections and enforcement actions for sediment and erosion control practices. <i>(Ongoing, Years 1-5)</i>
<p>Specific Components and Notes: Refer to BMP 1A for educational components related to this minimum control measure</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.4.6 BMP # 4F: Establishment of Procedures for Site Inspection and Enforcement

BMP Title: Establishment of Procedures for Site Inspection and Enforcement
Permit Section(s) Compliance Reference: 4.2.4.1.5; 4.2.4.1.6
<p>BMP Description: All construction activities on FLW are to follow the installation’s ‘Storm Water Pollution Prevention Plan’ (SWPPP), which includes sections for Storm Water Runoff Pollution Prevention, Erosion and Sediment Control, and Spill Control and Countermeasures. The SWPPP’s ‘Section C: Examples of Areas/Resources That Must Be Protected, Monitoring and Weekly Inspections Requirements, and Related Management Concerns’ specifically</p>

addresses the inspection and monitoring requirements.

FLW will evaluate the existing inspection and monitoring requirements in relation to the minimum control measures and permit requirements during the first year of the permit period. Any changes to the inspection and monitoring process will be implemented as needed. At a minimum, a tracking mechanism (ex. database, spreadsheet) for inspections and enforcement actions will be created and maintained.

For internal review process, enforcement mechanisms and sanctions; please refer to administrative procedure development process per BMP #4A.

Measurable Goals/ (Implementation Timeline):

- 1) Maintain copies of all construction site operator's permits and BMPs within the installation. (*Ongoing, Years 1-5*)
- 2) Develop tracking mechanism (ex. database) for inspection and enforcement action records. (*Years 1-2*)
- 3) Ensure inspectors for runoff control SWPPP and BMP evaluations have appropriate training. (*Ongoing, Years 1-5*)
- 4) Development of administrative procedure for internal review, enforcement mechanisms and sanctions (See 4A); (*Years 1-3*)

Specific Components and Notes:

Refer to BMP 1A for educational components related to this minimum control measure.

Responsible Party for this BMP:

Directorate of Public Works
Environmental Division, MS4 Program Manager
Phone: 573-596-0882

7.4.7 BMP # 4G: Evaluate the Success of Construction Site Storm Water Runoff Control

BMP Title: Evaluate the Success of Construction Site Storm Water Runoff Control

Permit Section(s) Compliance Reference: 4.2.4.1.7

BMP Description:

As part of the permit requirements, FLW must evaluate the success of each minimum control measure. The success of the Construction Site Stormwater Runoff Control Measure will mainly be measured through the decrease of stormwater runoff leaving construction sites on the installation. Although water quality monitoring is only conducted at identified outfalls for the NPDES installation-wide permit, it is expected that adherence to the installation's SWPPP will decrease polluted runoff. The inspection and enforcement of the SWPPP and implemented structural BMPs at each site will further ensure that construction site storm water runoff control measures are successful.

Measurable Goals/ (Implementation Timeline):

- 1) Adherence to the SWPPP at each construction site, which is tracked through the inspection and enforcement reporting procedures. (*Ongoing, Years 1-5*)

Specific Components and Notes:

Responsible Party for this BMP:

Directorate of Public Works
Environmental Division, MS4 Program Manager
Phone: 573-596-0882

7.5 Post-Construction Runoff Control

The goal for this minimum control measure is to develop, implement, and monitor a program to address discharges of post-construction storm water runoff from new development and redevelopment areas. Post-construction storm water management controls includes permanent structural and non-structural BMPs (e.g. conservation of natural and permeable areas, permeable pavers, rooftop runoff infiltration galleries, and mechanical storm drain filters) that remain in place after the project is completed and continue to prevent pollution from the new development.

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to address the quality of long-term storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the permittee’s regulated small MS4. The program should ensure that controls are in place that have been designed and implemented to prevent or minimize water quality impacts by reasonably mimicking pre-construction runoff conditions on all affected new development projects and by effectively utilizing water quality strategies and technologies on all affected redevelopment projects, to the maximum extent practicable.

The permittee should assess site characteristics at the beginning of the construction design phase to ensure adequate planning for storm water program compliance. The purpose for this approach is to arrive at designs and practices that provide for most effective water quality treatment through infiltration, flow rates and similar site-design opportunities.

The small MS4 operator is required to:

- Develop and implement strategies which include a combination of structural and/or nonstructural BMPs;
- Have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls to the extent allowable under State or local law;
- Ensure adequate long-term operation and maintenance of controls;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

A summary of each identified BMP for this Minimum Control Measure is listed below:

7.5.1 BMP # 5A: Regulatory Mechanism for addressing Post Construction Runoff

BMP Title: Regulatory Mechanism to Address Post Construction Runoff from New Development and Redevelopment
Permit Section(s) Compliance Reference: 4.2.5.1.2
<p>BMP Description:</p> <p>As part of the regulatory mechanism requirements, FLW will develop a command policy statement that addresses post-construction runoff from new and redevelopment projects that incorporates the Department of Defense guidance outlined below for incorporating Low Impact Development (LID) practices and the Army's 'Sustainable Ranges' mission.</p> <p>The US Army Corps of Engineers' Public Works Technical Bulletin 200-1-62, "Low Impact Development for Sustainable Installations: Stormwater Design and Planning Guidance for Development within Army Training</p>

Areas"(October 1, 2008), was developed to address the need for a set of standard operating procedures for stormwater management on a variety of military range sites. The intent of the technical bulletin is to provide appropriate guidance for the planning and application of LID technologies and practices in the setting of military range and training area development. Small scale, source controls provide the means to meet the environmental standards for stormwater management under the auspices of NPDES, Phase II and the Sustainable Ranges mission (Army Regulation 350-19) of the Department of Defense and the Army. The scope of the guidance includes soil and water conservation, nonpoint source pollution reduction/removal, and enhanced environmental aesthetics.

Establishing a policy for post-construction runoff controls that utilizes LID techniques and sustainable practices will ensure new and redevelopment projects on the installation mimic predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source. The use of LID at Army installations represents an environmentally sustainable approach to land and stormwater management that has multiple benefits. Further, use of LID technologies meets the mandate of Federal agencies to be the leaders in implementing environmentally sound technologies. Executive Order 13423 stipulated that all Federal land holding agencies are to be environmental leaders on all Federal lands.

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A summary of violations and enforcement actions will be submitted with annual reporting requirements of the MS4 Permit.

A four-level Continuum of Enforcement consisting of a Verbal Warning, a Letter of Warning, a Notice of Non-Compliance, and Regulatory Notification. The following provides greater detail regarding the Continuum of Enforcement for storm water quality, with subsections for each entity. This protocol uses the standard Federal Government business work days, Monday through Friday. Weekends and the ten Federal Holidays are not considered business days.

- 1) **Verbal Warning:** For Government tenants, contractors/concessionaires, and privatized activities: Verbal Warnings and informal notice for corrective action from Fort Leonard Wood. A Verbal Warning to be issued for conditions which are in violation and are under the control of the third party. Issuing office will be not lower than the DPW Environmental Office. The noticed party has seven business days from delivery, counting from and including the day of receipt, to take required corrective action and respond to the notice;
- 2) **Letter of Warning:** A Letter of Warning noting the violation, to be signed by Fort Leonard Wood, where the third party's activities represent a violation which are less immediate but represent greater gravity of consequences than would be appropriate for a Verbal Warning, or if the third party has not responded to the Verbal Warning. Issuing office will be not lower than the DPW Director's Office. The noticed party has seven business days from delivery, counting from and including the day of receipt, to take required corrective action and respond to the notice:

Government tenants – Failure to immediately commence corrective actions may result in a prohibition on activities directly contributing to the Violation at that site, except for corrective actions, up to and including a work stoppage at the site. A copy of the Letter of Warning will be provided to the next higher level of the agency or activity involved.

Government contractors/concessionaires - Failure to immediately commence corrective action of the violation may result in sanctions, through the administering Contract Officer. Sanctions may include but not limited to stop work orders, Notice to Cure, and adverse determinations on incentive performance award fees. A copy of the Letter of Warning will be provided to the Contracting Office responsible for award and administration of the contract involved.

Privatized entities - Failure to immediately commence corrective action will result in a Letter of Warning with a copy to the Federal agency responsible for administering the operating agreement with the privatized entity, and may result in initiation of action to bar culpable individuals from entry onto the military installation. A copy of the Letter of Warning will be provided to the next higher level of corporate management off the installation if applicable.

- 3) Notice of Non-Compliance:** A Notice of Non-Compliance will be issued to third parties informing all categories of individuals and organizations listed below of possible civil and/or criminal liability for the violation. The issuing officer will be the Deputy Garrison Commander, The noticed party of any category listed below has seven business days from delivery, counting from and including the day of receipt, to take corrective action and respond to the notice. In addition to the general provisions applicable to all types of parties listed in this paragraph, the additional information and measures below, including if the third party has not responded to the Verbal Warning or Letter of Warning, apply to particular types of parties involved:

Government tenants – Immediate cessation of the non-compliant conduct. Immediate initiation of corrective actions, impose appropriate limitations up to and including immediate prohibition of further non-corrective activities, or work stoppage at the project site until resolved. Formal investigations for misconduct or culpable negligence on the part of responsible individuals from the activity involved, ultimately to develop recommended means to prevent recurrence and to develop evidence supporting adverse administrative personnel actions on responsible military or civilian personnel, and/or Uniform Code of Military Justice disciplinary actions against responsible military personnel.

Government contractors/concessionaires - Immediate cessation of the non-compliant conduct. Immediate initiation of corrective, impose appropriate limitations up to and including immediate prohibition of further non-corrective activities, or work stoppage at the project site until resolved, if indicated. Failure to obey and commence corrective action may result in contractual sanctions through the administering contract officer, including but not limited to stop work orders, Contract Termination for Default, adverse determinations on incentive performance award fees, withholding of progress payments, and possible pursuit of debarment of individuals or entities from eligibility for Government contracts in cases raising fraud, waste, or abuse issues, and any other contractual remedy afforded under the Federal Acquisition Regulations or applicable supplements. A copy of the Notice of Non-Compliance will be provided to the responsible contracting office awarding and administering the contract involved, informing individuals and organizations of possible civil

and/or criminal liability for violation. Potential contractual sanctions include but are not limited to pass-through of any monetary assessments by regulators and ineligibility of same for any reimbursement by the Government, as well as notice delivered through the permittee's contract administrator of possible assertion of additional contract claims for consequential damages, costs, sureties, etc. to mitigate and restore the effects of such violations, based on the terms of the contract involved. Time deadlines for contract remedies are those required by the Federal Acquisition Regulations, the particular contract terms involved, and case law of the contract adjudicative forum (Generally the Armed Services Board of Contract Appeals) as made and provided, and under which the permittee must operate, which are acknowledged to generally be significantly longer than the seven calendar days to be afforded for the purposes of permit compliance.

Privatized entities - Immediate cessation of the non-compliant conduct. Immediate initiation of corrective actions, immediate prohibition of further non-corrective activities, or work stoppage at the specific project site until resolved, if indicated. Notice to the administering agency responsible for administering the operating agreement with the privatized entity. Copies of the notice will also be provided to the next higher level of corporate management of the entity off the installation, if applicable, and at least one step above any level of management apparently implicated in the violation. Further action by the installation may include initiation of action to bar any culpable individuals from entry onto the military reservation.

- 4) Regulatory Notification:** Failure to respond to the Notice of Non-Compliance or violations which cannot be enforced in a timely manner will be promptly reported to the regulatory agencies with civil enforcement powers able to issue a formal Notice of Violation and assess damages, penalties, fines, and other punitive or remedial consequences at the regulator's discretion. A copy of the regulatory notification will be provided the higher level of authority or management, and to the administering office, as applicable. Activities will bear the burden of restitution for any damages, penalties, fines or punitive consequences levied to Fort Leonard Wood regardless whether the regulatory agency issues similar to the third party.

Repeated offenses or a pattern of poor compliance, can also lead to bypassing the first, informal notice level and moving the issue straight into the second level (Letter of Warning) if the pattern is deemed to be a possible indicator of bad faith or demonstrate an unwilling or defiant approach to inspection, regulation, and compliance.

Measurable Goals/ (Implementation Timeline):

- 1) Develop command policy statement addressing post construction control requirements. (Year 1)
- 2) Review existing mechanisms for inspection and enforcement of post construction controls. (Years 1-2)
- 3) Implement inspection and enforcement policy addressing post construction controls. (Years 2-4)
- 4) Train personnel/contractors on policies and procedure related to post construction controls (Years 2-4)

Specific Components and Notes:

Responsible Party for this BMP:

Directorate of Public Works
 Environmental Division, MS4 Program Manager
 Phone: 573-596-0882

7.5.2 BMP # 5B: Development and Implementation of Structural and/or Nonstructural BMPs

BMP Title: Development and Implementation of Structural and/or Nonstructural BMPs

Permit Section(s) Compliance Reference: 4.2.5.1.5 - 4.2.5.1.6.2

BMP Description:

Post-construction storm water management controls, or green infrastructure, under the 2008 MS4 Small general Permit is required to reasonably mimic pre-existing run-off conditions on all regulated new developments and requires a measurable incremental improvement of water quality on all redevelopment projects. Fort Leonard Wood will work with the Directorate of Public Works and the U.S. Army Corps of Engineers to plan, define, and implement permanent structural and non-structural BMPs (green infrastructures) that help guide sustainable design and low impact development that minimize to the maximum extent practicable runoff pollution from the new development and/or redevelopment areas. This will include a water quality checklist for design meetings. All new development and redevelopment projects at FLW are planned in accordance with Army Regulation 210-20 'Real Property Master Planning for Army Installations', which specifies responsibilities for development and emphasizes the vital relationship between environmental planning, sustainable design and development, and real property master planning. These measures will ensure long-term operation and maintenance of new developments and redevelopments. Supplemental guidance documents with regard to green infrastructure will be referenced to aid in selection of Best Management Practices that address the need for green infrastructure.

Recognizing increases in volume and flow of stormwater, as well as sediment and nutrient loadings to receiving waters, FLW will develop a command policy statement with regard to post-construction controls that are sustainable and mimic pre-development hydrology through the use of LID techniques (see Section 7.5.1 BMP # 5A). LID is a site-specific approach to development planning and design. The LID approach is to use a range of source control practices that treat and reduce water volume as appropriate to the situation. LID practices are characterized by their straightforward constructability, lowered cost over the infrastructure lifecycle, and multiple environmental benefits beyond stormwater management such as habitat creation, aesthetic enhancement, and air quality benefits.

Activities for this BMP include:

- develop internal policies and procedures requiring the implementation of post-construction runoff controls
- ensure adequate long-term operation and maintenance of controls

Measurable Goals/ (Implementation Timeline):

- 1) Review and evaluate structural and non-structural BMPs, including current FLW long-range planning, construction site design process, and compatible LID practices for FLW developments. (*Years 1-2*)
- 2) Develop/Identify standard specifications for selected structural BMPs that are compatible with sustainable design and development. (*Years 1-2*)
- 3) Develop/Identify standard specifications for selected non-structural BMPs, particularly with regard to land-use master planning and sustainable design techniques. (*Years 1-2*)
- 4) Ensure adequate training for impacted audiences (See 1A) on long-term BMP site planning, design, and implementation/construction. (*Years 2-3*)
- 5) Incorporate post-construction structural and non-structural BMP requirements into site planning and review process. (*Years 1-2*)
- 6) Develop inspection and operations & maintenance programs for long-term BMPs. (*Year 2*)
- 7) Implement inspection and operations & maintenance programs for long-term BMPs. (*Years 3-5*)

Specific Components and Notes:

Responsible Party for this BMP:

Directorate of Public Works
Environmental Division, MS4 Program Manager

Phone: 573-596-0882

7.5.3 BMP # 5C: Long-term Operation and Maintenance of BMPs

BMP Title: Long-term Operation and Maintenance of BMPs
Permit Section(s) Compliance Reference: 4.2.5.1.3
BMP Description: In order to ensure that post-construction BMPs continue to function as designed, FLW will put in place policies and/or procedures ensuring the following, as appropriate: <ul style="list-style-type: none">• All individual SWPPP's contain operation and maintenance recommendations for each BMP in a project;• Responsibility for monitoring maintenance of long-term BMPs be assigned• Tools for inspecting and maintaining these BMPs are provided.• A tracking mechanism (ex. database) is maintained for all BMPs installed, and all inspection and corrective actions applicable
Measurable Goals/ (Implementation Timeline): <ol style="list-style-type: none">1) Evaluate existing FLW SWPPP and make revisions as necessary to provide for long-term operation and maintenance of BMPs and compliance with the FLW command policy statement (see BMP #5A) for post-construction controls. (<i>Year 1</i>)2) Develop tracking mechanism (ex. database) for all implemented long-term structural and nonstructural BMPs, and inspection and enforcement actions on the installation. (<i>Years 1-2</i>)3) Develop and implement program for inspection and maintenance of long-term control BMPs. (<i>Years 2-5</i>)
Specific Components and Notes:
Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882

7.5.4 BMP # 5D: Evaluate the Success of Post-Construction Runoff Controls

BMP Title: Evaluate the Success of Post-Construction Runoff Controls
Permit Section(s) Compliance Reference: 4.2.5.1.7
BMP Description: As part of the permit requirements, FLW must evaluate the success of each minimum control measure. The success of the Post-Construction Runoff Control Measure will mainly be measured through the development and compliance with the command policy statement regarding post-construction controls (BMP 5A), and the long-term operation and maintenance of both structural and nonstructural BMPs, as outlined in BMPs 5B-5C.
Measurable Goals/ (Implementation Timeline): <ol style="list-style-type: none">1) Adherence to the Post Construction Runoff Control Regulatory Mechanisms established and implemented on the installation (identified in BMP 5A). (<i>Ongoing, Years 1-5</i>)2) Successful long-term operation and maintenance of structural and nonstructural BMPs, as identified in BMPs 5B and 5C. (<i>Ongoing, Years 1-5</i>)
Specific Components and Notes:
Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882

7.6 Pollution Prevention/Good Housekeeping

The goal of this minimum control measure is to develop and implement a program to prevent or reduce pollutant runoff from facilities operation and maintenance activities. The program will include training of relevant staff in pollution prevention measures and techniques.

Recognizing the benefits of pollution prevention practices, the rule requires an operator of a regulated small MS4 to:

- Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;
- Include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator can use training materials that are available from EPA, their State, or relevant organizations;
- Determine the appropriate BMPs and measurable goals for this minimum control measure.

A summary of each identified BMP for this Minimum Control Measure is listed below:

7.6.1 BMP # 6A: Municipal Operations and Maintenance Program

BMP Title: Municipal Operations and Maintenance Program
Permit Section(s) Compliance Reference: 4.2.6.1 - 4.2.6.1.6
BMP Description: Develop and implement policies and procedures with the ultimate goal of preventing or reducing pollutant runoff from facilities and maintenance operations into the storm sewer system
Measurable Goals/ (Implementation Timeline): <ol style="list-style-type: none"> 1) Review existing Pollution Prevention/Good Housekeeping policies on FLW and identify opportunities for incorporating storm water pollution prevention practices. <i>(Year 1)</i> 2) Identify and create inventory of municipal operations and industrial facilities impacted by the operation and maintenance program BMP. <i>(Year 1)</i> 3) Develop and implement controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, parking lots, maintenance and storage yards, fleet or maintenance shops and other operational areas operated by FLW. <i>(Years 2-3)</i> 4) Develop and implement procedure for treatment and/or proper disposal of waste removed from the storm sewer system. <i>(Years 2-4)</i> 5) Develop and implement procedures to ensure that new and existing flood management projects are assessed for impacts on water quality or incorporation of water quality protection practices. <i>(Years 2)</i> 6) Continue compliance with FLW ‘Spill Prevention and Response Plan’. <i>(Ongoing, Years 1-5)</i>
Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882

7.6.2 BMP # 6B: Pollution Prevention/Good Housekeeping Training Program

BMP Title: Pollution Prevention/Good Housekeeping Training Program
Permit Section(s) Compliance Reference: 4.2.6.1.7
<p>BMP Description: Implement a Pollution Prevention/Good Housekeeping Training Program for all civilian and military personnel, contractors, businesses, and the community to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Identify existing and available pollution prevention/good housekeeping materials from federal, state, and local sources. <i>(Year 1)</i> 2) Identify distribution methods to each targeted audiences (ex: workshops, posters, etc). <i>(Years 1-2)</i> 3) Conduct trainings for pollution prevention/good housekeeping practices. <i>(Years 2-5)</i> 4) Evaluate impact of trainings for pollution prevention/good housekeeping practices. <i>(Years 2-5)</i> 5) Evaluate and revise educational materials as necessary to ensure target audiences are informed and complying with pollution prevention/good housekeeping practices. <i>(Years 2-5)</i>
<p>Specific Components and Notes: This BMP will be implemented in conjunction with the FLW Stormwater Education Program, see 1A for additional details.</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

7.6.3 BMP # 6C: Evaluate the Success of Pollution Prevention/Good Housekeeping

BMP Title: Identify Strategy for Mimicking Pre-Construction Runoff Conditions (New Developments)
Permit Section(s) Compliance Reference: 4.2.5.1.1; 4.2.4.1.4
<p>BMP Description: As part of the permit requirements, FLW must evaluate the success of each minimum control measure. The success of the Pollution Prevention/Good Housekeeping Measure will mainly be measured through adherence of policies and procedures implemented for stormwater pollution prevention practices, as outlined in BMP 6A.</p>
<p>Measurable Goals/ (Implementation Timeline):</p> <ol style="list-style-type: none"> 1) Adherence to the Municipal Operations and Maintenance Program established and implemented on the installation, identified in BMP 6A. <i>(Ongoing, Years 1-5)</i> 2) Trainings held and number of attendees for the Pollution Prevention/Good Housekeeping Training Program, identified in BMP 6B. <i>(Ongoing, Years 1-5)</i>
<p>Specific Components and Notes:</p>
<p>Responsible Party for this BMP: Directorate of Public Works Environmental Division, MS4 Program Manager Phone: 573-596-0882</p>

8. Reporting Requirements

8.1 Public Education and Outreach on Stormwater Impacts

As part of the MS4 Permit conditions, an annual report is required each year of the permit cycle. The annual report must document the following information related to public education and outreach:

- A description of the methods, frequency, type, and target audience of stormwater outreach performed during the permit term;
- A copy or representation of public outreach materials provided to the target audience(s);
- Educational materials, lesson plans, or presentations provided to school age students and other target audience(s) regarding stormwater runoff and water quality issues;
- An estimation of the number of people expected to be reached by the program over each year of the permit term; and
- The name or title of the person(s) responsible for coordination and implementation of the stormwater public education and outreach program.

8.2 Public Involvement/Participation

The annual report must document the following information related to public involvement/participation:

- Documentation of any events or other activities to clean up MS4 receiving waters;
- Documentation of any volunteer activities conducted to help actively engage residents and personnel at Fort Leonard Wood in understanding water resources and how their activities can affect water quality; and
- The name or title of the person(s) responsible for coordination and implementation of the storm water public education and outreach program

8.3 Illicit Discharge Detection and Elimination

The annual report must document the following information related to illicit discharge detection and elimination:

- A description of the program used to detect and eliminate illicit discharges into the MS4s, including procedures for detection, identification of sources, and removal of non-stormwater discharges from the storm sewer system;
- A description of the location and method of dry weather screening performed;

- A description of illicit discharges located and all actions taken to eliminate sources of illicit discharges;
- A description of training materials used and the frequency at which training was provided to the target audience(s) on how to respond to reports of illicit discharges;
- A description or citation of the established ordinance or other regulatory mechanism used to prohibit illicit discharges into the MS4;
- A copy or excerpt from the information management system used to track illicit discharges;
- A description of the categories of non-stormwater discharges evaluated as potentially being significant contributors of pollutants to the MS4 and any local controls placed on these discharges;
- A description of occasional incidental non-stormwater discharges and any controls placed on these discharges;
- A description of hazardous waste collection events and summary data which generally covers what was collected; and
- An inventory of industrial facilities that discharge into the permittee' MS4 or to waters of the United States within Fort Leonard Wood. The types of industrial activities that must be inventoried are set forth in 40 CFR §122.26(b)(14)(i) through (xi). This inventory must include the location of the activity, the location of its outfall and corresponding receiving water, and the NPDES permit status for its stormwater discharge.

8.4 Construction Site Stormwater Runoff Control

The annual report must document the following information related to construction site stormwater runoff control:

- A description of “regulated construction activities” which occurred at Fort Leonard Wood during the term of this permit;
- A description or citation of the established ordinance or other regulatory mechanism used to require erosion and sediment controls;
- A description of the sanctions and enforcement mechanisms Fort Leonard Wood uses to ensure that all “regulated construction activities” are in compliance with the terms of the Construction General Permit. This should include a description of any methods developed for Fort Carson staff to stop work on construction sites in non-compliance independent of contracting procedures;
- A description of the procedures for site plan review, including the review of pre-construction site plans, which incorporate consideration of potential water quality

impacts and applicable contract language;

- A description of the procedures for receipt and consideration of information submitted by the public;
- A description of the procedures for site inspection, including how sites will be prioritized for inspection, including documentation of the frequency of site inspections and methods for prioritizing site inspections; and
- The name or title of the person(s) responsible for coordination and implementation of the construction site runoff control program

8.5 Post-Construction Stormwater Management

The annual report must document the following information related to construction site stormwater runoff control:

- A description of the program to ensure that the pre-development hydrology is met for new development and re-development projects as required and the mechanism used to review the adequacy of post-construction BMPs;
- A description of the ordinance or other regulatory ordinance used to require the installation and maintenance of post-construction stormwater controls;
- A description of the program which ensures the long-term operation and maintenance of post-construction BMPs, including an excerpt from any data management system that includes maintenance requirements and schedules for post-construction BMPs installed during the year;
- A description of the process used to ensure that all DPW contracts initiated after the effective date of the permit contain language which requires the installation of post-construction stormwater controls and an excerpt of applicable contract language; and
- The name or title of the person(s) responsible for coordination and implementation of the post-construction stormwater management program

8.6 Pollution Prevention and Good Housekeeping

The annual report must document the following information related to pollution prevention and good housekeeping for municipal operations:

- A description of the operation and maintenance program intended to prevent or reduce pollutant runoff from municipal operations including a list of each of the activities evaluated under this program and a description of the controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, parking lots, maintenance and storage yards, waste transfer stations, fleet or maintenance shops with outdoor storage areas, snow disposal areas, and salt/sand storage locations;

- A description of the contents and frequency of the training program for municipal personnel and a list of the personnel or positions trained during the term of the permit;
- A description of the evaluation performed on the street cleaning operations, catch basin cleaning operations, and street sanding/salt practices and any measures taken as a result of the evaluation to minimize negative impacts to water quality.