

**NEVADA DEPARTMENT OF
TRANSPORTATION**

**CLEAR CREEK STORM WATER
MANAGEMENT PROGRAM**

January 2005

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List of Acronyms

BMP	Best Management Practices
CAMPO	Carson Area Metropolitan Planning Organization
CVCD	Carson Valley Conservation District
CCSWMP	Clear Creek Storm Water Management Program
DCP	Data Collection Platform
FPPP	Facility Pollution Prevention Plan
GIS	Geographic Information System
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NOAA	National Oceanic Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PDG	Planning and Design Guide
SIP	Site Improvement Permit
SWMP	Storm Water Management Program
TMDL	Total Maximum Daily Load
UNR	University of Nevada, Reno
USGS	United States Geological Survey

SECTION 1.0 INTRODUCTION

The Nevada Department of Transportation (NDOT) has developed this separate Clear Creek Storm Water Management Program (CCSWMP) in response to the National Pollutant Discharge Elimination System (NPDES) Permit issued to NDOT by the Nevada Division of Environmental Protection (NDEP). NDOT has included and italicized the individual permit requirements addressed in the beginning of each subsection of the CCSWMP and included the Permit in Appendix C of NDOT's Storm Water Management Program (SWMP)

[3.2.1 NDOT shall develop a separate Clear Creek Master Stormwater Management Program (CCSWMP). The CCSWMP must be developed, implemented, and enforced to reduce the discharge of pollutants to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. The CCSWMP shall include the following:]

[3.2.2 The CCSWMP shall be submitted to the Division for approval no later than one (1) year after the effective date of this permit.]

[3.2.1.9 And such other provisions as the permitting authority determines appropriate for the control of such pollutants.]

1.1 Clear Creek Introduction

This CCSWMP was developed to meet the requirements of the NPDES Permit for Storm Water Discharges from NDOT's Municipal Separate Storm Sewer Systems (MS4) into the Clear Creek watershed. This program seeks to reduce the discharge of pollutants in the Clear Creek basin associated with the storm water drainage systems that serve the highways and highway-related properties, facilities, and activities operated by NDOT. It identifies how NDOT will comply with the provisions of the NPDES statewide Permit (NV0023329, Section 3.2) (Permit) issued to NDOT by the NDEP on February 23, 2004.

The Clear Creek watershed runs between Spooner Summit and the Clear Creek confluence with Carson River west and south of Carson City. The basin is on the eastern front of the Sierra Nevada Carson Range. Clear Creek is a perennial stream with three perennial main branches and several small intermittent streams originating from springs or seeps. The Clear Creek watershed has an area of approximately 19 square miles. The watershed lies within both Carson City and Douglas County. Figure 1-1 displays the Clear Creek watershed.

1.2 NDOT Permit Coverage

In accordance with the Permit requirements, this CCSWMP contains the program elements to protect the watershed from degradation caused by polluted storm water runoff. NDOT's statewide SWMP elements will also apply to the Clear Creek watershed. The following table describes the sections of the CCSWMP that address the specific Permit requirements.

Table 1-1. Permit Requirements and CCSWMP Organization ⁽¹⁾	
Permit Requirements	Clear Creek Storm Water Management Program
3.2.1 Clear Creek Storm Water Management Program (CCSWMP)	Section 1.0-8.0
3.2.1.1 Best Management Practices (BMPs)	Section 3.0
3.2.1.2 Construction Site BMPs	Section 3.0
3.2.1.3 Control techniques for illicit discharges	Section 5.0
3.2.1.4 System design and engineering methods to prevent illicit discharges	Section 5.0
3.2.1.5 Schedule of implementation	Section 8.0
3.2.1.6 Monitoring program	Section 7.0
3.2.1.7 Listing of industrial facilities	Section 5.0
3.2.1.8 Illicit discharge inspections	Section 5.0
3.2.3 NDOT coordination with other MS4s	Section 1.0

(1) The following Permit sections do not require text in the CCSWMP: Section 3.2.1.9 and 3.2.2.

1.3 Municipal Storm Water Permittees Coordination

[3.2.3 NDOT may partner with other MS4s to develop and implement the CCSWMP.]

NDOT may select to coordinate with other municipalities to develop and implement NDOT's CCSWMP. NDOT recognizes the importance in combining resources and developing a cooperative understanding between the other MS4s with regulatory responsibilities in the Clear Creek watershed. NDOT may coordinate efforts with Douglas County, Carson City and/or Indian Hills General Improvement District to develop joint programs to protect the health of Clear Creek watershed. NDOT is responsible to clearly define the roles each permittee will assume in implementing each control measure.

SECTION 2.0**DOUGLAS COUNTY AND CARSON CITY'S CLEAR CREEK STORM WATER
MANAGEMENT PROGRAMS****2.1 Overview**

Prior to the Permit being issued to NDOT, there were two existing storm water management permits and plans in place for Clear Creek. Both Douglas County and Carson City in compliance with their NPDES General Permit for Discharges from Small MS4s filed a Notice of Intent prior to March 10, 2003 and developed individual CCSWMPs. The following is a brief summary of these two programs.

2.2 Douglas County Clear Creek Storm Water Management Program

Douglas County developed a CCSWMP specific to the area of Douglas County, which discharges into Clear Creek, identified as the Carson Area Metropolitan Planning Organization (CAMPO). The program elements of the CCSWMP include the six minimum measures of Public Education and Outreach on Storm Water Impacts, Public Involvement/Participation, Illicit Discharge Detection and Elimination, Construction Site Storm Water Runoff Control, Post Construction Storm Water Management in New Development and Redevelopment, and Pollution Prevention/Good Housekeeping for Municipal Operations.

The Public Education and Outreach on Storm Water Impacts component of the program in Douglas County proposes to develop a website to post the educational materials pertaining to storm water pollution and prevention. The materials on the website will include Best Management Practices (BMPs) available to the public and the business community as well as the minimum BMPs for downslope boundaries. The Douglas County CCSWMP will be presented at the County Commissioners public meeting, allowing opportunity for public comment, as part of the Public Involvement/Participation element.

The Illicit Discharge Detection and Elimination program will include development of storm water system maps to identify possible locations of illicit discharges into Clear Creek. Douglas County will develop a policy to trace and remove illicit discharges. The program will include inspection and sampling requirements when illicit discharges are detected to protect the health of Clear Creek. Illicit discharge information and the proposed policy for enforcement will be posted on the website to inform the public of this element of the storm water program.

The Construction Site Storm Water Runoff Control element of the program follows the procedures in the Douglas County Erosion Control Design Criteria manual. The design manual requires that the erosion controls listed in Nevada's BMP Manual be used at construction sites. The current program of tracking Site Improvement Permits (SIPs) will be used to track erosion control efforts at construction sites.

The Post Construction Storm Water Management in the New Development and Redevelopment aspect of the program falls under the County Development review process, which includes storm water runoff mitigation measures. The new development and redevelopment projects require BMPs to be utilized during the project life. The Douglas County's Design Manual and Master Plan require storm water mitigation measures for new and redevelopment projects which "seek to protect the surface water quality in the County from the effects of growth and urbanization".

The Douglas County CCSWMP Pollution Prevention/Good Housekeeping for Municipal Operations element references the operation and maintenance plan for the CAMPO portion of Clear Creek. This CCSWMP will also follow the existing erosion control and permitting program in Douglas County. Additional information concerning storm water pollution and prevention and maintenance of storm water systems will be posted on the website.

In addition to the six minimum control measures, the Douglas County CCSWMP describes a monitoring plan to include annual sampling of structural controls in the CAMPO area for typical pollutants found in storm water runoff. Monitoring in Clear Creek watershed is an important element in the storm water management program because monitoring data can be used to analyze effectiveness of controls.

2.3 Carson City Clear Creek Storm Water Management Program

Carson City, in compliance with its General MS4 Permit, developed and submitted a SWMP, including a separate CCSWMP, in September 2003. The Carson City CCSWMP is outlined within the context of the SWMP. The CCSWMP addresses the six minimum control measures and BMPs as described in the SWMP. The six minimum control measures are Public Education and Outreach, Public Participation and Involvement, Illicit Discharge Detection and Elimination, Construction Site Runoff Control, Post Construction Runoff Control, and Pollution Prevention/Good Housekeeping.

The Public Education and Outreach element of the Carson City CCSWMP involves distribution of educational materials to inform the public about storm water. An informed public is a key element in preventing damage to the receiving waters. The outreach materials include informative brochures, media materials, interaction with watershed groups, and promotion and development of stream teams. The Clear Creek outreach effort will target the construction and business/industry sectors to prevent sedimentation and post-construction storm water pollution.

The Carson City CCSWMP Public Involvement and Participation component may incorporate forming a MS4 advisory committee including a member from the Clear Creek Advisory Committee, Carson River Advisory Committee, and the Carson River Subconservancy. An additional public involvement and participation element will include holding a public meeting to introduce both the Carson City SWMP and CCSWMP. Furthermore, Carson City will encourage stream or watershed stewardship within the community.

The Illicit Discharge Detection and Elimination program element of the Carson City's CCSWMP is to develop a plan to detect and eliminate illicit discharges. Areas that are likely to have illicit discharges will be identified as well as sanitary sewers overflows or incorrect connections. The Carson City CCSWMP will identify commercial and industrial sites as part of the illicit discharge and detection program element and BMPs will be selected for sites or outfalls with potential non-storm water discharges.

The Construction Site Runoff Control section of the Carson City CCSWMP includes development, implementation, and enforcement of a program to protect Clear Creek from polluted discharges associated with construction site activities. This program includes plan review to insure storm water controls are appropriate, inspector training for site compliance, and development of a clearinghouse for information sharing. To further protect Clear Creek, construction site activity will employ specific BMPs to reduce pollutant discharges to the maximum extent practicable (MEP).

The CCSWMP also includes post development practices to reduce the impact of urbanization on the receiving waters as outlined in the Post-Construction Runoff Control section of Carson City's SWMP. This program will include structural and non-structural BMPs. Educational materials will describe the impacts of new development or redevelopment on the receiving waters in conjunction with general storm water quality information. Carson City will also develop an ordinance to control storm water quality.

The sixth minimum control measure in the Carson City CCSWMP is a Pollution Prevention/Good Housekeeping element. This element will develop an operation and maintenance program to include storm water quality training. The program will address municipal operations that have the greatest potential for contributing pollutants, especially pollutants of concern discharging into Clear Creek and other sensitive waters.

SECTION 3.0

BEST MANAGEMENT PRACTICES

3.1 Overview

[3.2.1.1 A detailed description of best management practices that will be implemented]

[3.2.1.2 A detailed description of sediment controls for all downslope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of a construction area.]

BMPs are chosen to protect and enhance the quality of the receiving waters from storm water runoff discharged from NDOT's MS4s. NDOT's Permit requires NDOT to define and describe the BMPs to be implemented in the CCSWMP. NDOT has created the Storm Water Quality Manuals; the Planning and Design Guide (PDG) and the Construction Site BMPs Manual (BMP Manual). The PDG explains NDOT's planning and project design process including guidance for implementing storm water controls into new projects. NDOT, through the development of the PDG, has approved a selection of permanent BMPs to be incorporated into NDOT projects. The BMP Manual provides detailed information on regulatory requirements concerning storm water mitigation at construction sites. The BMP Manual also provides selection and implementation guidance for NDOT-approved temporary BMPs for construction activity. This section will identify the permanent and temporary (construction) site BMPs NDOT has approved for use in the Clear Creek watershed.

3.2 Permanent BMPs

NDOT projects in the Clear Creek watershed require design consideration to select appropriate BMPs that will protect the receiving water to the MEP. This section will identify and describe the Permanent BMPs approved by NDOT and briefly discuss considerations for selecting individual permanent BMPs. Additional design and application information for the implementation of permanent controls is available in the NDOT PDG and the statewide SWMP.

NDOT has approved permanent BMPs for the CCSWMP that fall into one of two categories: soil stabilization (source control) or treatment control BMPs. These BMPs are implemented to control sedimentation and erosion. Soil stabilization BMPs aim to control the source of pollution. The

following table describes the soil stabilization BMPs approved for use at individual NDOT sites in the Clear Creek watershed.

Table 3-1. Permanent Soil Stabilization BMPs	
Soil Stabilization BMP	BMP Description
Consideration of Downstream Effects Related to Potentially Increased Flow (SS-1)	The planning and design elements that may be considered to protect the downstream environment from increased flows.
Preservation of Existing Vegetation (SS-2)	The planning consideration and rationale to preserve as much of the existing vegetation as possible.
Ditches, Berms, Dikes, and Swales (SS-3)	Conveyance structures used to intercept and redirect runoff to prevent erosion.
Slope Down Drains (SS-4)	Pipes, flumes, or paved spillway to convey surface runoff downslopes preventing erosion.
Flared Culvert End Sections (SS-5)	Flared end sections placed at the inlet or outlet of pipes and channels to enhance hydraulic operation and prevent scour and erosion.
Outlet Protection/Velocity Dissipation Devices (SS-6)	Energy dissipators to protect the outlet from scour and erosion due to the high velocity of the storm water flows.
Vegetated Surfaces (SS-7)	Vegetative surfaces installed in disturbed areas to minimize erosion and promote infiltration. However, past re-vegetation has not been widely successful in the Clear Creek watershed.
Mulching (SS-8)	The application of loose bulk material to disturbed soils to prevent wind and water erosion.
Slope Roughening/Terracing/Rounding (SS-9)	Techniques to create uneven surfaces to reduce the erosive potential by decreasing the velocity of the runoff, trapping sediment, and allowing infiltration into the soil.
Retaining Walls (SS-11)	Retaining walls used to stabilize slope surfaces and reduce slope length preventing scour and erosion.

The second classification of permanent BMPs, treatment control BMPs are employed to reduce the amount of pollutants in storm water by using a physical, biological, or chemical mechanism. Treatment controls treat the storm water runoff before it is discharged into receiving waters. Treatment controls can also be employed when discharging directly into receiving waters or addressing projects that may have special requirements such as Total Maximum Daily Load (TMDL) considerations. Clear Creek has been listed on Nevada's 2002-303(d) impaired waters list for pH. A TMDL for Clear Creek has not been established.

The treatment controls approved by NDOT for use at sites in the Clear Creek watershed are listed in Table 3-2.

Treatment Control BMP	BMP Description
Infiltration Basins (TC-2)	Designed to capture and hold runoff allowing infiltration, promoting pollutant removal, and reducing runoff volumes. Conditions in Clear Creek may require infiltration basins to be used in conjunction with sand traps.
Detention Basins (TC-3)	Used to capture and detain storm water runoff promoting pollutant removal.
Traction Sand Traps (TC-4)	Allows traction sand to settle out of highway runoff before discharged into receiving waters.
Gross Solids Removal Devices (TC-5)	Designed to remove trash and solids from storm water runoff through physical and mechanical means.

The NDOT-approved Permanent BMPs can be applied to NDOT projects in the Clear Creek watershed on a project-by-project basis. The application of an individual BMP requires the designer to consider objectives for both types of permanent BMPs, soil stabilization BMPs and treatment control BMPs.

The following design objectives are considered before selecting which permanent soil stabilization BMPs are to be included in the project design:

- Prevent downstream erosion
- Stabilize areas of disturbed soils
- Maximize areas of vegetation

The main design consideration for treatment controls is to reduce the pollutant load in storm water runoff before discharging into the receiving waters while considering possible site-specific constraints (e.g. right-of-way). Projects in Clear Creek will follow the same process of BMP selection and implementation as other NDOT projects as described in the statewide SWMP.

3.3 Construction Site BMPs

Construction or temporary BMPs are used to control sedimentation at construction sites. This section identifies and describes the BMPs selected by NDOT for potential use at construction sites in the Clear Creek watershed. The statewide SWMP outlines the Construction Site BMP Program element to be implemented by NDOT. The statewide SWMP Construction Site BMP Program element includes NDOT construction activity in the Clear Creek watershed.

Tables 3-3 and 3-4 describe the temporary BMPs for soil stabilization and sediment control that may be considered for construction sites in the Clear Creek watershed. NDOT's BMP Manual provides working details for these soil stabilization and sediment control BMPs.

Temporary Soil Stabilization BMP	BMP Description
Scheduling (SS-1)	Scheduling construction activities in conjunction with construction site BMPs to reduce the impact on the site and surrounding area.
Preservation of Existing Vegetation (SS-2)	Identifying and protecting the vegetation at the site to provide erosion and sediment control.
Hydraulic Mulch (SS-3)	Applying fiber mixture and tackifier with hydromulching equipment to protect soil from erosion.
Hydroseeding (SS-4)	Applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydromulch equipment to minimize erosion.
Soil Stabilizer (SS-5)	Applying soil stabilizer to exposed soils to temporarily protect soils from erosion.
Straw Mulch (SS-6)	Incorporating a uniform layer of straw by roller or stabilizing emulsion to protect disturbed soils.
Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats (SS-7)	Temporarily stabilizing disturbed soils by placing mats, covers, or erosion control blankets on soil.
Wood Mulching (SS-8)	Applying wood mulch to minimize erosion, increase infiltration, and reduce surface runoff.
Earth Dikes/Drainage Swales & Lined Ditches (SS-9)	Structures designed to divert and convey runoff away from sensitive areas.
Outlet Protection/Velocity Dissipation Devices (SS-10)	Techniques to reduce erosion and scour at outlet by reducing velocity of runoff.

Table 3-3. Temporary Soil Stabilization BMPs - Continued

Temporary Soil Stabilization BMP	BMP Description
Slope Drains (SS-11)	Conveying surface runoff away from slopes and into stabilized areas to prevent erosion.
Streambank Stabilization (SS-12)	Employing any number of BMPs in the stream zone to protect the stream.
Wind Erosion Control (SS-13)	Applying water or soil stabilizers to minimize dust or wind erosion.

Table 3-4. Temporary Sediment Control BMPs

Temporary Sediment Control BMP	BMP Description
Silt Fence (SC-1)	Sediment barrier made of permeable fabric designed to slow runoff and intercept sediment before leaving the construction site.
Sediment Basin (SC-2)	Temporary basin to capture and detain runoff, allowing sediments to settle out before water is discharged.
Sediment Trap (SC-3)	Temporary containment to settle out sediment before infiltration or discharge.
Check Dam (SC-4)	Rock, gravel bags, or fiber rolls placed across channel to reduce flow velocity and scour in channel or drainage ditch.
Fiber Rolls (SC-5)	Rolls or wood excelsior, rice, straw or coconut fibers bound and placed at the toes and along the face of slopes to intercept runoff, reduce slope length, and remove sediment.
Gravel Bag Berm (SC-6)	Single row of gravel bags placed across a slope to intercept runoff and provide sediment removal.
Street Sweeping and Vacuuming (SC-7)	Removal of tracked sediment to prevent sediment from entering conveyance systems or receiving waters.
Storm Drain Inlet Protection (SC-8)	Protection of storm drain inlets from construction site sediment-laden runoff.

Several of the BMPs listed in this section of the CCSWMP are applicable to downslope boundaries at construction sites in the Clear Creek watershed as the right-of-way will allow. NDOT, in the BMP Manual, has selected the following BMPs as the required minimum measures to address slope protection:

- Geotextiles and Erosion Control Blankets (SS-7)
- Earth Dikes/Drainage Swales and Lined Ditches (SS-9)
- Slope Drains (SS-11)
- Fiber Rolls (SC-5)
- Gravel Bag Berm (SC-6)

NDOT recognizes these BMPs as the minimum required BMP options. The BMP Manual recommends employing at least one of these minimum required BMPs. Additional BMPs may be required and implemented for slope protection depending on site-specific conditions.

Additional temporary BMPs selected by NDOT are categorized as follows: Tracking Control, Non-Storm Water Management, and Waste Management and Materials Pollution Control BMPs. These BMPs are described in the following three tables and are defined in NDOT's BMP Manual.

Table 3-5. Tracking Control BMPs	
Tracking Control BMP	BMP Description
Stabilized Construction Entrance/Exit (TC-1)	Stabilizing the entrance and exit of construction sites to reduce tracking sediment onto public roads.
Stabilized Construction Roadway (TC-2)	Stabilize construction roads to limit erosion or dust from vehicle traffic.
Entrance/Outlet Tire Wash (TC-3)	Tire wash stations to clean tires and undercarriage to prevent sediment from being transported onto public roads.

Table 3-6. Non-Storm Water Management BMPs	
Non-Storm Water Management BMP	BMP Description
Water Conservation Practices (NS-1)	Activities using water conservatively to avoid causing erosion or transporting sediments off the site.
Dewatering Operations (NS-2)	Managing non-storm water and accumulated storm water and removing the water from the site.
Paving and Grinding Operation (NS-3)	Practices to minimize the release of pollutants associated with these activities into the storm drain system.
Temporary Stream Crossing (NS-4)	Temporary stream crossing during construction projects to minimize the impact to the waterway.
Clear Water Diversion (NS-5)	Practices to isolate the construction site from live water by diverting waters around the site and limiting the impact the construction activity has on the waterway.
Illicit Connection/Illegal Discharge detection and Reporting (NS-6)	Activities which identify and report illicit discharges or illegally dumped materials at construction sites.
Potable Water/Irrigation (NS-7)	Practices to manage discharges from irrigation activities, discharges from potable water, water line flushing, and hydrant flushing.
Vehicle and Equipment Cleaning (NS-8)	Procedures to protect the downstream environment from discharges associated with vehicle cleaning.
Vehicle and Equipment Fueling (NS-9)	Procedures to prevent fuel spills and leaks into the storm drain system and receiving waters.
Vehicle and Equipment Maintenance (NS-10)	Vehicle and equipment maintenance procedures to prevent the discharge of pollutants into the storm drain system.
Pile Driving and Drilling Operation (NS-11)	Controls to reduce the discharge of pollutants during pile driving operations.
Concrete and Pavement Curing (NS-12)	Practices to control the potential pollutants from the chemical and water methods used in concrete curing.
Material and Equipment Use Over Water (NS-13)	Procedures on barges or boats to properly store, use, and dispose of materials to prevent discharge of pollutants into the waterways.
Concrete Finishing (NS-14)	Activities to minimize the runoff from concrete finishing methods and employ site protection methods to prevent runoff from impacting receiving waters.
Structure Demolition/Removal Over or Adjacent to Water (NS-15)	Demolition and removal control practices to reduce the potential for wastes and debris entering the waterways.
Temporary Batch Plants (NS-16)	BMPs presented to assist with permit compliance as temporary batch plants must comply with the General Permit requirements

Table 3-7. Waste Management and Materials Pollution Control BMPs	
Waste Management and Materials Pollution Control BMP	BMP Description
Material Delivery and Storage (WM-1)	Descriptions of the proper handling and storage of materials to minimize discharges into the receiving waters.
Material Use (WM-2)	Practices for using materials to protect the downstream environment from potential discharges.
Stockpile Management (WM-3)	Management procedures to reduce the potential for discharges from stockpiles of soil and paving materials.
Spill Prevention and Control (WM-4)	Methods to prevent spills and procedures for managing and reporting spills.
Construction Debris and Litter Management (WM-5)	Managing stockpiles and construction site wastes to prevent impacting the downstream environment.
Concrete Waste Management (WM-6)	Concrete waste practices to prevent the waste materials from entering the storm drain system.
Sanitary/Septic Waste Management (WM-7)	Proper placement and maintenance of sanitary/septic waste materials to prevent discharge into the storm drain system.
Liquid Waste Management (WM-8)	Management practices to control non-hazardous liquid materials at construction sites.

SECTION 4.0 MAINTENANCE

[3.2.1.5 A schedule of implementation for all short term and long term activities describing the program development, implementation and maintenance]

NDOT's Maintenance Division will incorporate the Permit requirements concerning maintenance into NDOT's Maintenance Program. The maintenance activities within the Clear Creek watershed are consistent with the maintenance activities described in NDOT's statewide SWMP.

Additionally, NDOT's Spooner Sand and Salt Shed will develop and implement a Facility Pollution Prevention Plan (FPPP) per the Permit requirements. The FPPP will describe the facility and the control measures in place to prevent the discharge of pollutants from the site. The BMP selection, implementation, and maintenance at the site will be documented in the FPPP. The Spooner Sand and Salt Shed FPPP will be kept on record by NDOT maintenance according to Permit requirements, and revised as needed.

SECTION 5.0

ILLICIT DISCHARGE AND DETECTION PROGRAM

5.1 Overview

Illicit discharges are any non-storm water discharges typically due to an incorrect connection, mismanaged facilities, or illegal dumping. Since NDOT is not a typical MS4, it is unlikely a discharger would have access to the NDOT storm drain system to complete an illegal connection. NDOT will incorporate an awareness program for illicit discharges into NDOT's Maintenance Program developed as part of the statewide SWMP.

5.2 Inspection Program

[3.2.1.8 An inspection program that ensures no illicit discharge into Clear Creek]

The Maintenance Division is responsible for inspecting individual outfalls as scheduled. NDOT maintenance personnel will be trained to recognize and report illicit discharges during routine maintenance activities. The illicit discharge detection element of NDOT's statewide SWMP includes a public outreach element to illustrate to the public the hazards of illicit discharges to the health of receiving waters.

5.3 Engineering Methods and Control Techniques

[3.2.1.4 A detailed description of system design and engineering methods used to protect Clear Creek from illicit discharges of pollutants]

[3.2.1.3 A detailed description of control techniques used to MEP to ensure no illicit discharge of pollutants into Clear Creek.]

NDOT, in compliance with the Permit, may use the information gathered from detections of illicit discharges to review the engineering methods and control techniques to prevent future discharges. The BMP Manual describes the procedures and practices associated with identifying and controlling illicit discharges in the working detail of the Illicit Connection/Illicit Discharge Detection and Reporting BMP. NDOT will use the Illicit Connection/Illicit Discharge Detection and Reporting BMP to train employees how to identify and report illicit discharges. NDOT's maintenance staff will be trained to recognize signs or indicators of illicit discharges when

performing routine inspections in the Clear Creek watershed and follow the reporting procedures. Illicit discharges are reported to the Environmental Services Division.

5.4 Industrial Facilities

[3.2.1.7 A listing and tracking program for all industrial facilities that have the potential to discharge a pollutant into Clear Creek]

NDOT does not own or operate any industrial facilities in the Clear Creek watershed. NDOT will evaluate any illicit discharges for possible connections to industrial facilities and address such connections accordingly.

SECTION 6.0**PUBLIC OUTREACH AND EDUCATION**

The Public Outreach and Education element of NDOT's statewide SWMP is intended to inform the public of the importance of storm water mitigation in protecting the downstream environment. The public outreach element in the statewide SWMP will include the Clear Creek watershed. NDOT will, within the life of the Permit, coordinate efforts with other MS4s to fulfill the Public Outreach and Education element. Currently, NDOT participates in the Clear Creek Watershed Council and attends monthly meetings.

SECTION 7.0

CLEAR CREEK MONITORING AND PROJECT PLANNING

[3.2.1.6 A monitoring program to ensure the overall quality and health of Clear Creek.]

7.1 Overview

The Monitoring Program in the Clear Creek watershed is an important component in the CCSWMP. Monitoring identifies the areas of concern within the watershed as well as provides information to analyze erosion controls and related BMPs for effectiveness. The recent monitoring report, the Clear Creek Erosion Assessment Final Report, January 2003, focused on identifying and classifying the areas of erosion within the watershed. This study provides a solid description of the watershed and will support future studies. NDOT has also contracted with U.S. Geological Survey (USGS) to monitor and collect additional data to address erosion issues in the watershed. These monitoring plans assist NDOT in planning projects in the watershed to address erosion and protect Clear Creek.

7.2 Clear Creek Erosion Assessment Final Report

The Clear Creek Erosion Assessment Final Report (Final Report) identified sources and mitigation controls for erosion and sedimentation in the Clear Creek watershed. The project was funded by NDOT. The project consultant reported directly to the Clear Creek Steering Committee, comprised of representatives from NDOT, Carson Water Subconservancy District, United States Forest Service, Washoe Tribe of Nevada and California, Carson City, Douglas County and Natural Resource Conservation Service, Nevada Division of State Lands, and NDEP.

The assessment of the existing conditions in Clear Creek required data collection, hydraulic and hydrologic analysis, and environmental analysis. From the assessment and categorization of erosive activity in the watershed, mitigation alternatives were presented with associated construction costs.

The data collection process reviewed relevant studies of Clear Creek. The study by Fisher (Flume Development for a Study of Bedload and Suspended Sediment in Clear Creek Drainage, UNR DeLaMare Thesis #1246, by John Fisher, 1978) provided the most notable information with discussions of the sediment load and the geographic condition within the watershed. Fisher's study documented the potential for erosion due to steep slopes, fragile vegetation, and weathered granite and yet attributed the lack of erosion to the lack of thunderstorms and high infiltration rates. Additional information was collected through stakeholders participation in a questionnaire aimed to obtain more information and identify areas of interest to further investigate. The stakeholders who participated in the questionnaire were NDOT, Carson Water Subconservancy, Carson City, United States Forest Service, and Michael and Sharon Arnold.

The hydrologic and hydraulic analysis required collection of hydrologic data to create a Geographic Information System (GIS) database for the watershed. Rainfall records for the area were taken from the National Oceanic and Atmospheric Administration (NOAA) for the 2-year 24-hour, 25-year 24-hour, and 100-year 24-hour events. Soils were categorized by soil type and hydrological soil group, which is a classification dependent on soil type and amount of runoff expected from a given area. The land use in the area was also categorized to distinguish between different types of ground cover. The hydraulic analysis developed peak 25-year frequency flood event rates to investigate the amount of flow collected and bypassing highway US 50 drop inlets and cross culverts.

The environmental assessment required field investigation to identify areas of erosion and sedimentation. Field investigations included data collection and categorization of sedimentation, erosion, water quality, habitat, biota, and aquatic species for the main channel and channel riparian zones as well as the location of drainage structures. The environmental analysis was designed to establish a baseline condition of the riparian vegetation. The accessible areas along the main channel were visually inspected. Seven different areas were defined based on plant communities, flow regimes, and channel substrate. The seven areas were further identified by land use, riparian vegetation, stream channel substrate, turbidity, and sedimentation. The data was organized, tabulated, and mapped for concise analysis and future use.

The study of Clear Creek watershed measured the impact of erosion on a watershed basis. The source of sediment loading in the main channel was attributed to tributary streams and bank erosion within the main channel. The primary activities associated with the erosion and sedimentation are clearing or damaging existing vegetation, increasing the amount of impervious surfaces, and diverting runoff into concentrated flows thereby increasing its destructive energy and/or altering the natural drainage patterns in the watershed.

The goal of the study was to develop mitigation alternatives and measure their associated construction costs. The Final Report recommends increased attention to construction site practices to prevent further erosion in the watershed. The specific construction site BMPs recommended included protecting the natural vegetation, preventing soil loss, reusing surface soils, installing silt fences, attending to heavy use areas, and formulating a spill prevention program. Additionally, controls should have the capacity to slow runoff velocities before entering the conveyance system promoting the settling of pollutants and preventing scouring at the outlet. The five types of erosion sources identified in Clear Creek are culvert outlets, channels, slopes, Clear Creek main channel banks, and headcuts. The BMPs recommended to address these issues are namely culvert extensions with sufficient sections of rip rap at the outlet, pipe extensions, geotextile warps, fiber logs, hydroseed and native plantings, erosion control blankets, mulching, root wads, coir rolls and sediment basins. The Final Report recommends BMP maintenance is scheduled after major flood events as well as annual inspections of culvert outlets and sediment basins. The results of this study may be used in the selection of BMPs and design of future monitoring programs in the Clear Creek watershed.

The Final Report for Clear Creek watershed is a reference for NDOT from which to make future decisions for the management of NDOT facilities to insure the protection of the Clear Creek watershed to the maximum extent practicable.

7.3 NDOT and USGS Clear Creek Monitoring

NDOT has partnered with USGS to monitor Clear Creek to address erosion issues within the watershed. The goal of the monitoring project is to establish a comprehensive dataset of water quality and sediment characteristics. It is important to establish the current physical and chemical characteristics of the basin to enable evaluation of control or mitigation efforts in the future. The project will collect suspended and bedload sediment and water quality samples between four sites in the Clear Creek watershed over a two-year period (2004-2005).

The project approach will use the existing USGS gaging station in the middle reach of Clear Creek near Carson City and three additional sites, two along the mainstream and one on a tributary. The three additional sites will be sampled for suspended and bedload sediments and water quality. The selection of the three additional sites was driven by dividing Clear Creek into sections with one above construction erosion structures, one at the mid-elevation point in the meadow section, and one downstream US 395 to allow monitoring alongside the highway. The data collection consists of routine field measurements, routine sediment samples, and analysis of nutrients, major constituents and trace constituents in water samples. At the gaging station in Clear Creek, a Data Collection Platform (DCP) will be installed to monitor runoff events and snowmelt. All data will be stored in the USGS National Water Information Database and published in the USGS Annual Report.

This monitoring project will advance the understanding of hydrologic processes in Clear Creek watershed and provide assistance for water resource information planning and operation procedures. The collection of data will increase the understanding of sediment transport and ultimately allow the erosion control structures to be analyzed for usefulness. NDOT, as a participant in this study, will be able to access the data and analytically assess the effectiveness of the erosion control measures applied to NDOT facilities. Following completion of this study, the Monitoring Program in this CCSWMP will be revised to provide ongoing monitoring that builds on the results and conclusions of the NDOT/USGS study.

In addition to the joint NDOT and USGS monitoring project in the Clear Creek watershed, NDOT will not exclude the watershed from the Monitoring Program to be developed in the statewide SWMP.

7.4 NDOT's Current and Future Projects in the Clear Creek Watershed

The Clear Creek watershed monitoring projects have enabled NDOT to develop project plans to address water quality within the watershed. NDOT has identified strategies to protect Clear Creek. Projects in Clear Creek have been identified by NDOT to address slope stability, erosion control, and structural deficiencies of existing drainage facilities. Currently, NDOT has contracted with the Carson Valley Conservation District (CVCD) with input from the Clear Creek Watershed Council and the Clear Creek steering committee to construct erosion control projects. Alternatively, NDOT is researching the feasibility of installing a storm drain pipe within the US 50 corridor to protect the watershed. The storm drain will convey storm water from the roadway along the highway corridor to a detention basin for treatment and will be discharged back into Clear Creek. NDOT will evaluate this alternative within the first year of the Permit life and report NDOT's strategy for Clear Creek projects in the statewide SWMP's Annual Report.

**SECTION 8.0
PROGRAM SCHEDULE**

[3.2.1.5 A schedule of implementation for all short term and long term activities describing the program development, implementation and maintenance]

NDOT will implement the CCSWMP program elements per the Permit requirements and consistent with the statewide SWMP implementation schedule. The development, implementation, and maintenance of the CCSWMP will be assessed in the Annual Report. The following table lists the program element, measurable goals, and proposed implementation dates for the CCSWMP.

Table 8-1. Implementation Schedule					
Program Elements	Year				
	2004-05	2005-06	2006-07	2007-08	2008-09
Public Outreach and Education					
Coordination with other MS4s for on-going public outreach and education programs					
Maintenance					
Develop and implement FPPP for Spooner					
Monitoring					
Coordinate monitoring with other MS4s					
Projects					
Complete feasibility study for NDOT's storm drain in Clear Creek					