Spokane County, Washington

Stormwater - Operations and Maintenance Plan

as required by:

Eastern Washington

Phase II Municipal Stormwater Permit

December 2010

Index

Sections

Section 1 Introduction....2
Section 2 O&M Plan Primary Components....2
Section 3 O&M Plan Facilities and/or Activities....2
3.1 Stormwater Collection and Conveyance System....3
3.2 Roads, Highways and Parking Lots....5
3.3 Vehicle Fleets....7
3.4 Municipal Buildings....8
3.5 Parks and Open Space....10
3.6 Construction Projects....11
3.7 Industrial Activities....12
3.8 Material Storage Areas, Heavy Equipment Storage Areas and Maintenance Areas....13
3.9 Flood Management Projects....13
3.10 Other Facilities....14
Section 4 Best Management Practices....14
Section 5 Department Responsibility - Summary....15
Section 6 Record Keeping and Reporting....17
Section 7 Training....17
Section 8 Common Pollutants, Sources and Impacts....17
Section 9 Definitions....18

Tables

Table 3-1 Stormwater Collection and Conveyance....3-4
Table 3-2 Roads, Highways and Parking Lots....6
Table 3-3 Vehicle Fleets....7
Table 3-4 Municipal Buildings....9
Table 3-5 Parks and Open Space....10
Table 5-1 Department Responsibility....15-16
Table 8-1 Common Stormwater Pollutants, Sources and Impacts....18

Appendices

Appendix A Inspection and Maintenance Checklist
Appendix B Site Visit Assessment Form
Appendix C Stormwater Pollution Prevention Plan (SWPPP)

Section 1. Introduction

Spokane County is currently subject to the requirements of the Eastern Washington Phase II Municipal Stormwater Permit (Phase II Permit). The Phase II Permit is based on the Federal Clean Water Act which is implemented under the National Pollutant Discharge Elimination System (NPDES). The Environmental Protection Agency (EPA) has an agreement with the State of Washington to administer the Phase II Permit to local jurisdictions.

Under the Phase II Permit, Spokane County is required to develop and implement a municipal Operations and Maintenance (O&M) Plan to protect water quality and reduce the discharge of pollutants into receiving waters of the state from municipal operations. Those waters include surface waters, groundwater, and the stormwater collection and conveyance system.

Section 2. O&M Plan Primary Components

The following five (5) primary components must be addressed by the Operations and Maintenance Plan.

- Develop a Schedule of Municipal Operations and Maintenance Activities.
- Pollution prevention and good housekeeping Best Management Practices (BMPs).
- Schedule of inspections and requirements for record keeping.
- Identify the department responsible for each activity.
- Provide training for employees with primary construction, operations, or maintenance job functions.

Section 3. O&M Plan Facilities and/or Activities

Spokane County's employees engage in a number of activities that may impact water quality. This O&M Plan addresses stormwater pollution prevention and good housekeeping practices for the ten (10) facilities and/or activities listed below.

1. Stormwater Collection and Conveyance System
2. Roads, Highways, and Parking Lots
3. Vehicle Fleets
4. Municipal Buildings
5. Parks and Open Space
6. Construction Projects
7. Industrial Activities
8. Material Storage Areas, Heavy Equipment Storage Areas and Maintenance Areas
9. Flood Management Projects
10. Other Facilities

Below are a detailed descriptions and compliance plans for the ten (10) O&M Plan facilities and/or activities

3.1 Stormwater Collection and Conveyance System

Phase II Permit Language. "*Stormwater collection and conveyance system, including catch basins, stormwater sewer pipes, open channels, culverts, structural stormwater controls, and structural runoff treatment and/or flow control facilities. The O&M Plan shall address, but is not limited to: regular inspections, cleaning, proper disposal of waste removed from the system, and recordkeeping. No later than 180 days prior to the expiration date of this permit, Permittees shall implement catch basin cleaning, stormwater system maintenance, scheduled structural BMP inspections and maintenance, and pollution prevention/good housekeeping practices.*"

Catch basin and roadside ditch inspections are scheduled based on priority areas. High priority facilities are those roadside facilities adjacent to major arterials. High priority areas will be inspected annually and low priority areas will be inspected every three years on a rotating schedule. Table 3-1 shows the proposed maintenance schedule and inspection frequencies for the Stormwater Collection and Conveyance System.

Table 3-1
Stormwater Collection and Conveyance System - Schedule and Inspection Frequencies

Facility Type	*Inspection Frequency*	*Maintenance Schedule*
Management Facilities		
Oil Water Separators	annually	June and October
Infiltration Facilities and Trenches	annually	Summer, Spring or Fall
Bio-Swales: High priority facilities	Annually	Summer
1/3 of low priority areas	Year A	Summer
1/3 of low priority areas	Year B	Summer
1/3 of low priority areas	Year C	Summer
Tanks and Vaults	Annually	Summer
Ponds (Detention, Water Quality, Evaporation, Infiltration)	Annually	Summer
Control Structures	Annually	Summer

Table 3-1 Stormwater Collection and Conveyance System - Schedule and Inspection Frequencies		
Facility Type	*Inspection Frequency*	*Maintenance Schedule*
Sand Filters	Annually	Summer
Proprietary Treatment Devices	<Manufacturer Recommendation – annual?>	As per required specifications
Others:		
Conveyance System		
Catch Basins: High priority facilities	Annually	Summer
1/3 of low priority areas	Year A	Summer
1/3 of low priority areas	Year B	Summer
1/3 of low priority areas	Year C	Summer
Roadside Ditches: High priority areas	Annually	Summer
1/3 of low priority areas	Year A	Summer
1/3 of low priority areas	Year B	Summer
1/3 of low priority areas	Year C	Summer
Culverts: High priority areas	Annually	Summer
1/3 of low priority areas	Year A	Summer
1/3 of low priority areas	Year B	Summer
1/3 of low priority areas	Year C	Summer

*All Phase II compliance activities must be implemented prior to the August 15, 2011 Permit compliance deadline.

3.1.a Responsible Departments

All Spokane County Departments that have stormwater collection and conveyance system facilities within their jurisdictional properties are responsible for performing all activities as stated herein.

3.1.b Vegetation Management

Vegetation management includes maintaining landscaping within swales, infiltration areas, ponds, controlling noxious weeds, pests, and unwanted vegetation growth, etc.

3.1.c Major Storm Event Inspections

Spot checks for potentially damaged stormwater treatment and flow control facilities will be conducted after major storm events (greater than 10-year recurrence interval rainfall or snowmelt).

3.1.d Field Inspections

During field inspections, inspectors should utilize the inspection checklists in Appendix A to document the condition of each facility and identify any required maintenance activities. Any identified maintenance needs should be reported to the responsible department, so that work orders can be developed to complete the repair or cleaning.

The "Inspection and Maintenance Checklist - Stormwater Collection and Conveyance System" (checklist) form in Appendix A should be used during regular inspections to indicate when cleaning or repairs are needed. The recommended maintenance standards for each type of facility are described in detail within Chapter 5, Appendix 5A, and Chapter 6, Appendix 6A, of the Stormwater Management Manual for Eastern Washington (see Manual for details).

3.1.e Waste Disposal

Waste generated from cleaning of catch basins and other stormwater management and treatment facilities must be disposed of according to the requirements of local and state regulations. In cases where dangerous or hazardous contamination are suspected, the waste material must be tested to determine the proper disposal method. Material in catch basins with obvious contamination (unusual color,

staining, corrosion, unusual odors, fumes, and oily sheen) should be left in place or segregated from other wastes until testing results can identify the nature of the contaminants. Contaminated materials must be disposed of at properly licensed facility.

3.2 Roads, Highways, and Parking Lots

Phase II Permit Language. *"Roads, highways, and parking lots. The O&M Plan shall address, but is not limited to: deicing, anti-icing, and snow removal practices; snow disposal areas; material (e.g. salt, sand, or other chemical) storage areas; and all-season BMPs to reduce road and parking lot debris and other pollutants from entering the MS4. No later than 180 days prior to the expiration date of this permit, Permittees shall implement all pollution prevention/good housekeeping practices established in the O&M Plan for all roads, highways, and parking lots with more than 5,000 square feet of pollutant generating impervious surface that are owned, operated, or maintained by the Permittee."*

Spokane County is responsible for maintaining County jurisdictional roads, highways, and parking lots. See table 3-2 for details. Pollutants accumulate on roadway surfaces and parking lots from pavement and vehicle wear, atmospheric deposition, and littering. Hydrocarbons, copper, and other heavy metals are deposited on roads from clutch and break wear, vehicle exhaust, and leaking motor fluids. Degrading road surfaces, litter, and trash, also add pollutants to stormwater runoff. Anti-icing chemicals that include acetate can deplete dissolved oxygen, increase conductivity, and increase pH of receiving waters. Sand used for winter traction can accumulate in the stormwater collection and conveyance system, carrying pollutants into receiving waters. If properly managed, regular municipal street maintenance activities can have a positive impact on the health of local aquatic resources.

Table 3-2
Roads, Highways, and Parking Lots - Activity, Frequency and Responsibility

Potential Pollutants: Sediment, Hydrocarbons, Heavy Metals, Toxic Chemicals, Debris/Litter

Activity	*Current Activity*	*Meets Phase II Requirements**	*Frequency*	*Responsibility*
Sweeping major arterials	X	X	annually	E & R - Maint.
Sweeping/Cleaning parking lots	X	X	annually	Facilities, E&R Maint., Utilities, Fair & Expo; Parks, Human Resources
Sweeping all residential streets	X	X	annually	E & R Maint.

Designated snow disposal areas	X	X	N/A	E & R Maint., Fair & Expo; Parks
Storage of De-icing liquids	X	X	N/A	E & R Maint., Facilities, Utilities, Fair & Expo; Parks
Storage of sanding materials	X	X	N/A	E & R Maint., Facilities, Utilities, Fair & Expo; Parks

*All Phase II compliance activities must be implemented prior to the August 15, 2011 Permit compliance deadline.

3.2.a Street Repair and Maintenance

Street repair and maintenance activities include road surfacing (repairing potholes, sealing cracks, overlaying roads, and paving shoulders), pavement marking, signage and signal repairs, and small construction projects. The BMPs related to these activities are described below.

3.2.b Vegetation Management

Vegetation management includes maintaining landscaping for roadway right-of-ways and medians and controlling noxious weeds, pests, and unwanted vegetation growth.

3.3 Vehicle Fleets

Phase II Permit Language. *"The O&M Plan shall address, but is not limited to: storage, washing, and maintenance of municipal vehicle fleets. No later than 180 days prior to the expiration date of this permit, Permittees shall conduct all vehicle and equipment washing and maintenance in a self contained covered building or in designated wash and/or maintenance areas operated to separate wash water from stormwater."*

Spokane County is responsible for maintaining County owned vehicles and equipment in proper working order. Vehicle maintenance activities have the potential to spill or leak fluids, fuel, or other polluting liquids. Vehicle washing can also contribute soap, debris, and pollutants into the stormwater collection and conveyance system. Table 3-3 shows the proposed activity, inspection frequency and responsibility for vehicle fleet areas.

Table 3-3 Vehicle Fleets - Activity, Frequency and Responsibility			
Potential Pollutants: Sediment, Hydrocarbons, Heavy Metals, Toxic Chemicals, Debris/Litter			
	Current Activity	*Frequency*	*Responsibility*
Sweep vehicle storage parking lots annually	X	Annually	Engineering & Roads; Utilities; Facilities; Fair & Expo, Parks, Sheriff
Maintain spill kit onsite at all times	X	Continually	Engineering & Roads; Utilities; Facilities; Fair & Expo, Parks, Sheriff
Conduct all vehicle washing indoors/ or qualified wash areas	X	Continually	Engineering & Roads; Utilities; Facilities; Fair & Expo, Parks, Sheriff

*All required new activities must be implemented prior to the August 2011 to be in compliance with the Phase II Permit.

3.3.a Vehicle Storage

When vehicles and equipment are parked or stored outside without cover they have the potential to leak or drip hazardous fluids that can be carried to the stormwater system during a rain or snow melt event. Vehicle storage areas shall be maintained according to the Stormwater Pollution Prevention Plan (SWPPP) included in Appendix C to prevent polluted stormwater discharge to surface waters of the state.

3.3.b Vehicle Maintenance

Vehicle and equipment maintenance and repair conducted by Spokane County may include vehicle fluid removal, engine repair, engine and parts cleaning, and various general maintenance activities. All vehicle maintenance activities shall be conducted indoors or at a qualified outdoor facility to reduce potential polluted stormwater discharges to surface waters of the state.

3.3.c Vehicle Washing

In accordance with Spokane County's Illicit Discharge Ordinance, vehicle wash water is prohibited from entering any part of the stormwater system that discharges to surface waters of the state.

3.4 Municipal Buildings

Phase II Permit Language. *"The O&M Plan shall address, but is not limited to: cleaning, washing, painting and other maintenance activities. No later than 180 days prior to the expiration date of this permit, Permittees shall implement all pollution prevention/good housekeeping practices established in the O&M Plan for buildings owned, operated, or maintained by the Permittee."*

Spokane County is responsible for the maintenance of County owned municipal buildings. Municipal building maintenance includes cleaning, washing, painting, and landscape maintenance. Potential pollutants from these activities include organic compounds, oil and grease, soap, heavy metals, and particulate matter. All municipal building maintenance activities shall be conducted indoors, when possible, to reduce potential pollutant discharges into the stormwater system. Table 3-4 shows the proposed activity, inspection frequency and responsibility for the municipal buildings.

Table 3-4
Municipal Buildings - Activity, Frequency and Responsibility

Potential Pollutants: Sediment, Nutrients, Hydrocarbons, Heavy Metals, Toxic Chemicals, Debris/Litter

	Current Activity	*Required New Activity**	*Frequency*	*Responsibility*
Maintain a spill kit onsite at all times	X		Continually	Engineering & Roads; Utilities; Facilities; Fair & Expo; Parks
Cover storm drain inlets prior to pressure washing (where required)		X	As needed	Facilities; Fair & Expo; Parks
Properly clean maintenance equipment	X		Annually	Engineering & Roads; Utilities; Facilities; Fair & Expo; Parks
Properly Clean painting equipment	X		Every occurrence	Facilities; Fair & Expo; Parks

*All required new activities must be implemented prior to the August 2011 to be in compliance with the Phase Permit.

3.4.a Cleaning and Washing

Municipal building cleaning and washing activities may include washing of carpet and other interior items and/or conducting pressure washing of buildings, rooftops, and other large structures associated with a municipal building. Wash

water from municipal building washing practices has the potential to be contaminated with pollutants harmful to stormwater such as sediment and chemicals.

3.4.b Painting

Painting activities associated with interior or exterior municipal buildings include surface preparation and application of paints, stains, finishes and other coatings. Paints, stains, and finishes contain harsh chemicals and can contaminate stormwater.

3.4.c Winter Activities

Winter activities around municipal buildings include deicing, sanding, and snow removal on sidewalks. These activities protect public safety during inclement winter weather.

3.5 Parks and Open Space

Phase II Permit Language. *"The O&M Plan shall address, but is not limited to: proper application of fertilizer, pesticides, and herbicides; sediment and erosion control; BMPs for landscape maintenance and vegetation disposal; trash management; and BMPs for building exterior cleaning and maintenance. No later than 180 days prior to the expiration date of this permit, Permittees shall implement park and open space maintenance pollution prevention/good housekeeping practices at all park areas and other open spaces owned or operated by the Permittee."*

Spokane County is responsible for the maintenance of County owned parks and open space. The maintenance of parks and open space areas frequently includes fertilization, mowing, pesticide application, and supplemental irrigation. Potential pollutants from these activities include nutrients, chemicals, organic debris, and sediment. Improving the way park and open space maintenance activities are conducted can reduce the amount of stormwater pollution that is conveyed to local aquatic resources. Table 3-5 shows the proposed activity, inspection frequency and responsibility for the parks and open space.

Table 3-5 Parks and Open Space - Activity, Frequency and Responsibility			
Potential Pollutants: Sediment, Nutrients, Heavy Metals, Pathogens, Toxic Chemicals, Debris/Litter			
	Current Activity	*Frequency*	*Responsibility*
Properly apply pesticides, herbicides and fertilizers	X	Continually	Facilities; Fair & Expo; Utilities; Engineering &

			Roads - Maintenance; Parks
Inspect irrigation systems annually	X	Annually	Facilities; Fair & Expo; Utilities; Engineering & Roads - Maintenance; Parks
Manage trash on a regular basis	X	Continually	Facilities; Fair & Expo; Utilities; Engineering & Roads - Maintenance; Parks
Properly manage sediment and erosion during maintenance activities	X	Continually	Facilities; Fair & Expo; Utilities; Engineering & Roads - Maintenance; Parks
Follow proper landscape maintenance procedures and vegetation disposal	X	Continually	Facilities; Fair & Expo; Utilities; Engineering & Roads - Maintenance; Parks

*All required new activities must be implemented prior to the August 2011 to be in compliance with the Phase Permit.

3.5.a Vegetation Management

Proper turf management and landscape maintenance practices have the potential to reduce the amount of stormwater runoff and the amount of pollutants that drain to receiving waters. Vegetated spaces provide an excellent opportunity to infiltrate precipitation as it falls and filter pollutants before they can be washed into the stormwater system. Vegetation management includes maintaining landscaping throughout park and open space areas, erosion and sediment control, proper vegetation disposal, proper fertilization, pesticide and herbicide application, and controlling noxious weeds, pests, and unwanted vegetation growth.

3.5.b Trash Management

Trash and debris removal helps prevent garbage and leachate from entering the stormwater conveyance system and polluting receiving waters.

3.5.c Storage Areas

Maintenance vehicles, equipment, and uncovered material stockpiles have the potential to leak or contribute pollutants to the stormwater system during rain or snow melt events. Vehicle, equipment, and material storage areas should be maintained according to the SWPPP included in Appendix C.

3.6 Construction Projects

Phase II Permit Language. *"Public construction projects shall comply with the requirements applied to private projects. All construction projects owned or operated by the Permittee that are required to have an NPDES permit shall be covered under either the General NPDES Permit for Stormwater Discharges Associated with Construction Activities or another NPDES permit that covers stormwater discharges associated with the activity. All public projects approved after the effective date of this permit shall include construction and post-construction controls selected and implemented pursuant to the requirements in Appendix 1."*

During construction, proper erosion and sediment controls should be used to prevent sediment-laden stormwater from flowing away from the site and into the stormwater collection and conveyance system. Ecology requires construction sites greater than one acre (or that are part of a common plan of development that accumulatively is greater than one acre) to document their planned sediment and erosion control techniques and to obtain an NPDES Construction Stormwater General Permit from Ecology.

The following construction projects are required to have a *NPDES Construction Stormwater General Permit*. Refer to Ecology's website or regional office for additional information.

- Clearing, grading and/or excavation (including forest practices) that results in the disturbance of one or more acres and discharges stormwater to surface waters of the State; or
- Clearing, grading and/or excavation on sites smaller than one or more acres that are part of a larger common plan of development or sale that will ultimately disturb one acre or more, and discharge stormwater to surface waters of the State; or
- Any size construction activity discharging stormwater to waters of the State that Ecology determines to be a significant contributor of pollutants to waters of the State of Washington or that Ecology reasonably expects to cause a violation of any water quality standard.

The following construction activities are exempt from NPDES permit coverage:

- Construction activities that discharge all stormwater and non-stormwater to ground water, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.
- Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Municipal projects that are subject to the NPDES Construction Stormwater Permit should refer to the Spokane Regional Stormwater Manual and the Stormwater Management Manual for Eastern Washington for information regarding the required construction and erosion and sediment control design criteria and best management practices (BMPs).

3.7 Industrial Activities

Phase II Permit Language. "*All facilities owned or operated by the Permittee that are required to have NPDES permit coverage shall be covered under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that covers stormwater discharges associated with the activity."*

Industrial activities require proper erosion and sediment controls to be used to prevent sediment-laden stormwater from flowing away from the site and into the stormwater collection and conveyance system. Industrial activities are typically subject to the Ecology issued Industrial Stormwater *General Permit* (Industrial Permit) that authorizes stormwater discharges associated with industrial activities. The Industrial Permit requires the development and implementation of a SWPPP and a sampling plan specific to the permitted facility.

3.8 Material Storage Areas, Heavy Equipment Storage Areas and Maintenance Areas

Phase II Permit Language. *"No later than 180 days prior to the expiration date of this permit, Permittees shall develop and implement a Stormwater Pollution Prevention Plan to protect water quality at each of these facilities owned or operated by the Permittee and not required to have coverage under the General NPDES Permit for Stormwater discharges Associated with Industrial Activities or another NPDES permit that covers stormwater discharges associated with the activity. Generic Stormwater Pollution Prevention Plans that can be applied at multiple sites may be used to comply with this requirement."*

The Phase II Permit requires all material storage areas, heavy equipment storage areas, and maintenance areas to develop and implement a SWPPP to protect water quality and prevent the discharge of contaminated stormwater to surface or groundwater. The SWPPP describes both operational and structural BMPs that will be implemented at each facility.

The following Spokane County properties are covered by the SWPPP (see Appendix C).

- Central Shop
- Old Corral Shop

- Plantes Ferry Park-Shop Area
- Flora Pit
- Carnahan Pit
- Utilities Material Storage, Maintenance, Equipment and Shop Areas
- Fair and Expo Storage, Maintenance, Equipment and Shop Areas

A copy of the SWPPP must also be kept on hand at each of the facilities listed above.

The "Operations and Maintenance Site Visit Assessment Form" attached in Appendix B shall be used during the assessment of material storage, heavy equipment storage areas and maintenance areas.

3.9 Flood Management Projects

Phase II Permit Language. *"No later than 180 days prior to the expiration date of this permit Permittees shall implement provisions to assess water quality impacts in the design of all new flood management projects that are associated with the MS4 or that discharge to the MS4, including considering use of controls that minimize impacts to site hydrology and still meet project objectives. Permittees are encouraged to review and evaluate existing flood management projects that are associated with the MS4 or that discharge to the MS4 to determine whether changes or additions should be made to improve water quality."*

Spokane County is responsible for the design and review of proposed flood management projects. During the design of all new flood management projects, Spokane County's engineers will assess the water quality impacts of the proposed project and consider the use of controls to minimize impacts to site hydrology.

3.10 Other Facilities

Phase II Permit Language. *"Other facilities that would reasonably be expected to discharge contaminated runoff. Permittees shall identify these facilities, include BMPs to protect water quality from discharges from these sites in the O&M Plan, and implement the BMPs no later than 180 days prior to the expiration date of this permit."*

Spokane County also conducts other maintenance activities that have the potential to impact waters of the state and stormwater runoff, such as;

- Sanitary Sewer System Maintenance
- Swimming Pool Maintenance

Spokane County is responsible for operation and maintenance of a sanitary sewer system. Maintenance and repairs to sanitary sewer systems have the potential to impact receiving waters.

Spokane County is responsible for managing public swimming pools. Draining swimming pools to the stormwater collection and conveyance system is against Spokane County Code. Swimming pools shall be drained to a swale or landscaped area and the water allowed to infiltrate into the ground.

Section 4. Best Management Practices (BMPs)

The Stormwater Management Manual for Eastern Washington, Chapter 8, Source Control, Section 8.3.2, Pollutant Source-Specific BMPs (see Manual for details), describes in detail the Best Management Practices (BMPs) for all municipal operations and activities. For reference, the Table of Contents from Section 8.3.2 of the Eastern Washington Manual is listed below:

BMPs for the Building, Repair, and Maintenance of Boats and Ships 8-11
BMPs for Commercial Animal Handling Areas 8-13
BMPs for Commercial Composting 8-14
BMPs for Commercial Printing Operations 8-16
BMPs for Deicing and Anti-Icing Operations - Airports and Streets 8-17
BMPs for Airport Deicing and Anti-icing Operations 8-17
BMPs for Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots 8-19
BMPs for Dust Control at Manufacturing Areas 8-20
BMPs for Fueling at Dedicated Stations 8-21
BMPs for Illicit Connections to Storm Drains 8-24
BMPs for Landscaping and Lawn/Vegetation Management 8-25
BMPs for Loading and Unloading Areas for Liquid or Solid Material 8-31
BMPs for Log Sorting and Handling 8-34
BMPs for Maintenance and Repair of Vehicles and Equipment 8-35
BMPs for Maintenance of Public and Private Utility Corridors and Facilities 8-37
BMPs for Maintenance of Roadside Ditches 8-38
BMPs for Maintenance of Stormwater Drainage and Treatment Systems 8-40
BMPs for Manufacturing Activities - Outside 8-41
BMPs for Mobile Fueling of Vehicles and Heavy Equipment 8-42
BMPs for Painting/ Finishing Coating of Vehicles/Boats/ Buildings/ Equipment 8-44
BMPs for Parking and Storage of Vehicles and Equipment 8-46
BMPs for Railroad Yards 8-47
BMPs for Recyclers and Scrap Yards 8-47
BMPs for Roof/ Building Drains at Manufacturing and Commercial Buildings 8-48
BMPs for Soil Erosion and Sediment Control at Industrial Sites 8-48
BMPs for Spills of Oil and Hazardous Substances 8-49
BMPs for Storage of Liquid, Food Waste, or Dangerous Waste Containers 8-51

BMPs for Storage of Liquids in Permanent Above-ground Tanks 8-53
BMPs for Storage or Transfer (Outside) of Solid Raw Materials, By-Products, or Finished Products 8-55
BMPs for Urban Streets 8-57
BMPs for Washing and Steam Cleaning Vehicles/ Equipment/ Building Structures 8-59
BMPs for Wood Treatment Areas 8-61

Section 5. Department Responsibility - Summary

Individual Spokane County Departments are responsible facilities and activities that fall under their jurisdiction as follows described in Table 5-1.

Table 5-1
Department Responsibility

Facilities and Activities	*Responsible Department(s)*	*Facility/Activities (including but not limited to)*
Stormwater Collection and Conveyance System	Engineering & Roads - Maintenance, Facilities, Utilities, Fair & Expo; Parks	catch basins, storm sewer pipes, open channels, , ditches, culverts, swales, structural stormwater controls, and structural runoff treatment and/or flow control facilities, etc.
Roads, Highways, and/or Parking Lots Roads, Highways, and Parking Lots (cont.)	Engineering & Roads - Maintenance (roads & highways); Facilities, Fair & Expo; Utilities; Human Resources; Parks (parking lots)	deicing, anti-icing, snow removal practices, snow disposal areas, material storage areas (e.g. salt, sand or other chemical), street and parking lot cleaning
Vehicle Fleets	Engineering & Roads - Motorpool; Utilities; Fair & Expo; Parks; Sheriff; Parks	storage, washing, and maintenance of vehicle fleets
Municipal Buildings	Facilities; Spokane County Fair and Expo Center; Engineering & Roads; Utilities; Parks	cleaning, washing, painting and other building maintenance activities
Parks and Open Space	Parks; Facilities; Engineering & Roads, Maintenance; Fair &	Application of fertilizer, pesticides, and herbicides; sediment and erosion control;

Table 5-1 Department Responsibility		
Facilities and Activities	*Responsible Department(s)*	*Facility/Activities (including but not limited to)*
	Expo	landscape maintenance; vegetation disposal, trash mgt; building exterior cleaning and maintenance
Construction Projects	All Spokane County Departments that Facilitate Construction Projects	Construction activities that disturb 1 acre or more, or are less than 1 acres but are part of an overall development plan over 1 acre
Industrial Activities	Subject to NPDES Industrial Stormwater Permit and/or an NPDES Construction Permit	N/A
Material Storage Areas, Heavy Equipment Storage Areas and Maintenance Areas	Engineering & Roads; Utilities; Parks, Recreation and Golf; Facilities; Spokane County Fair and Expo Center; Sheriff	material storage - all departments; heavy equipment storage - E&R; Util, Fair; maintenance - all departments
Flood Management Projects	Engineering & Roads, Environmental Services	Review of flood management projects
Other Facilities	Parks; Utilities, others where applicable	Swimming pool draining; maintenance and repair of sanitary sewer system

Section 6. Recordkeeping and Reporting

The department conducting the specific operations and maintenance activity is responsible for keeping records of road and parking lot maintenance activities that have the potential to impact stormwater. Recordkeeping required by the Phase II Permit is limited to documenting any liquid or material spills that could carry pollutants into the stormwater collection and conveyance system.

Spills should be reported to Engineering & Road - Stormwater Utility (or call the stormwater hotline at 509-477-7525) and to in the case of a hazardous chemical spill, 911 should be called immediately. All paperwork related to the spill and cleanup activities should be reported to Engineering & Road - Stormwater Utility.

Section 7. Training

Phase II Permit Language. *"All Spokane County Departments shall provide training for all employees who have primary construction, operations, or maintenance job functions that are likely to impact stormwater quality. The permittee shall identify target employees to participate in the training sessions. Training shall address the importance of protecting water quality, the requirements of this permit, operation and maintenance requirements, inspection procedures, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures to reporting water quality concerns, including potential illicit discharges. Follow-up training shall be provided as needed to address changes in procedures, methods or staffing."*

Target employees shall include the following; all employees that perform maintenance or construction activities in areas subject to stormwater discharge to the municipal separate storm sewer system (MS4) that connect to surface waters of the state. Examples include, but may not be limited to: maintenance or construction within the roads, highways or parking lots; maintenance or construction work on public buildings; and maintenance or construction work on parks or open spaces.

Section 8. Common Pollutants, Sources, and Impacts

Stormwater runoff contains pollutants that can harm human health, degrade water quality and habitat, and impair ecosystem functions. These pollutants originate from vehicles, businesses, residential activities, and municipal activities, and include oil, hydrocarbons, heavy metals, deicers, sediment, household products, pesticides/herbicides, fertilizer, and bacteria. During rain and snow melt events, stormwater runoff may accumulate these pollutants which are then washed into receiving waters. Table 8-1 shows the sources of common stormwater pollutants and their potential impacts.

Table 8-1
Common Stormwater Pollutants, Sources, and Impacts

Pollutant	*Sources*	*Impacts*
Sediment	construction sites; eroding stream banks and lakeshores; winter sand and salt application; vehicle/boat washing; agricultural sites	destruction of plant & fish habitat; transportation of attached oils, nutrients & other pollutants; increased maintenance costs; plugged conveyance systems; flooding
Nutrients (phosphorus, nitrogen)	fertilizers; malfunctioning septic systems; livestock, bird & pet waste; vehicle/boat washing; grey water; decaying grass and leaves; sewer overflows; leaking trash containers, leaking sewer lines	increased potential for nuisance or toxic algal blooms; increased potential for hypoxia/anoxia (low levels of dissolved oxygen which can kill aquatic organisms)

Hydrocarbons (petroleum compounds)	vehicle and equipment leaks and emissions; pesticides; fuel spills; equipment cleaning; improper fuel storage & disposal	toxic to humans and aquatic life at low levels
Heavy Metals	vehicle brake and tire wear; vehicle/equipment exhaust; batteries; galvanized metal; paint and wood preservatives; fuels; pesticides; cleaners	toxic to humans and aquatic life at low levels; drinking water contamination
Pathogens (bacteria)	livestock, bird and pet wastes; malfunctioning septic systems; sewer overflows; damaged sanitary lines	risk to human health leading to closure of shellfish areas and swimming areas; drinking water contamination
Toxic Chemicals	pesticides; dioxins; Polychlorinated Biphenyls (PCBs); spills, illegal discharges and leaks	toxic to human and aquatic life at low levels
Debris/Litter	improper waste disposal & storage; fishing gear; leaking rubbish containers; cigarette butts; littering	potential risk to human & aquatic life, can clog conveyance systems; can cause flooding

Source: Rabasca and Rinehart, 2006

Section 9. Definitions

See the Eastern Washington Municipal Stormwater Permit, the Spokane Regional Stormwater Manual, and the Stormwater Management manual for Eastern Washington for applicable definitions.

Acknowledgement: Portions of this document were derived from a standard O&M template created by OTAK, Inc.

Appendix A

Inspection and Maintenance Checklist

Stormwater - Operations and Maintenance

Inspection and Maintenance Checklist

Stormwater Collection and Conveyance System

Date of Inspection: _____ Maintenance District: _____

Field Inspector(s): _____ Reason for Inspection: _____

Rain: In Last 48 hrs: yes/no Major Storm Event Inspection: yes/no

Facility Type	Location		Maintenance Needed		Maintenance Follow-up	
(CB, DET, etc)	Parcel	Address	Maint. Code	Description/Action Needed	Date Completed	Completed by

Facility Types:

CB - catch basin
M - manhole
S- swale
DR - drywell
C - culvert
IS - infiltration strip
DET - detention facility
RP - retention pond
O - other
EV - evaporation pond
IP - infiltration pond
DP - dry pond
RD - roadside ditch
WP - wet pond

Maintenance Codes:

1 – Accumulated Sediment
2 – Trash & Debris
3 – Vegetation Concerns
4 – Water Quality Concerns
5 – Impeded Water Flow
6 – Erosion
7 – Structural Repairs
8 – Cover/Frame/Grate
9 – Damaged Pipes
10 – Mosquito/Vector Breeding
11 – Other
12 – Could Not Locate

Maintenance standards are based on the *Stormwater Management Manual for Eastern Washington* and the *Spokane Regional Stormwater Manual*.

Appendix B

Site Visit Assessment Form
Stormwater - Operations and Maintenance

For Material Storage Areas,
Heavy Equipment Storage Areas and Maintenance Areas

Inspector: _____ **Stormwater Operations and Maintenance Site Visit Assessment Form** Date: _____

Facility: _____ Contact: _____ Category: _____
Parcel #: _____ Lat: _____ Long: _____

1) Waste Management: N/A? ☐ *Sketch location of dumpsters and used oil containers on site map.*

Dumpsters:	Yes ☐	No ☐	**BMP's** ☐	**Condition:**	Good ☐	Fair ☐	Poor ☐ **Photos:** _____
Trash Compactors:	Yes ☐	No ☐	**BMP's** ☐	**Condition:**	Good ☐	Fair ☐	Poor ☐
Recycling Cont.:	Yes ☐	No ☐	**BMP's** ☐	**Condition:**	Good ☐	Fair ☐	Poor ☐
Petroleum Products	Yes ☐	No ☐	**BMP's** ☐	**Condition:**	Good ☐	Fair ☐	Poor ☐

Notes _____
_____
_____

2) Cleaning and Washing: N/A? **Vehicles** ☐ **Heavy and Light Equip** ☐ **Tools** ☐ **Indoors** ☐ **Outdoors** ☐
☐ *Sketch the drainage characteristics of the wash area on site map.*
Wash water drains to: Catch Basin ☐ Drywell ☐ Swale ☐ Dirt ☐ Street ☐ **Photos:** _____
Existing BMP's Yes ☐ No ☐ **Condition:** Good ☐ Fair ☐ Poor ☐
Notes _____
_____
_____

3) Transfer of Solids and Liquids: N/A? **Containers:** Barrels ☐ Bags ☐ Bottles ☐ Boxes ☐ Other _____
Secondary Containment Yes ☐ No ☐
Material Safety Data Sheets accessible: Yes ☐ No ☐ **Spill Clean-up Kits** Yes ☐ No ☐ **Photos:** _____
Existing BMP's Yes ☐ No ☐ **Condition:** Good ☐ Fair ☐ Poor ☐
Notes _____
_____
_____

4) Production and Application Activities: N/A? **Painting** ☐ **Coating** ☐ **Spraying** ☐ **Other** ☐
☐ *Sketch location of production/application activities and drainage characteristics on site map.*
Designated Locations Yes ☐ No ☐ **Indoors** ☐ **Outdoors** ☐ **Photos:** _____

Drainage Characteristics _____

Existing BMP's Yes ☐ No ☐ **Condition:** Good ☐ Fair ☐ Poor ☐

Notes _____

_____

_____

5) Material Storage: N/A? ☐ *Sketch storage area locations and drainage characteristics on site map.*

Type of Materials Stored: _____

Indoors ☐ **Outdoors** ☐ **Drainage Characteristics:** _____

Existing BMP's Yes ☐ No ☐ **Condition:** Good ☐ Fair ☐ Poor ☐ **Photos:** _____

Notes _____

_____

6) Vehicles and Equipment: N/A? **Maintenance** ☐ **Parking** ☐ **Repair** ☐ **Storage** ☐

☐ *Sketch locations of storage and parking areas, structures, surfaces, floor drains, drainage characteristics, and location of clean-up kits on site map.*

Location: Indoors ☐ Outdoors ☐ **Structures:** Yes ☐ No ☐ **Shop Floors Clean:** Yes ☐ No ☐

Surface Type: Asphalt ☐ Concrete ☐ Dirt/Gravel ☐ **Floor Drains:** Yes ☐ No ☐ **Photos:** _____

Drainage Characteristics: _____

Solid Wastes Disposed Properly: Yes ☐ No ☐ **Leaks:** Yes☐ No ☐ **Spill Clean Up Kits Easily Accessible** Yes ☐ No ☐

Notes: _____

_____

7) Dust, Erosion, Sediment, and Landscape Maintenance: N/A? ☐ *Sketch erosion, sediment, and landscape maintenance on site map.*

Dust Producing Activities: Yes ☐ No ☐ **Exposed or Eroded Soils:** Yes ☐ No ☐ **Deposited Sediment:** Yes ☐ No ☐

Pesticides/Herbicides Used: Yes ☐ No ☐ **Stored in Lockable Cabinet/Signage:** Yes ☐ No ☐ **Applied by Licensed Operators** Yes ☐ No ☐

Photos: _____

Notes: _____

_____

8) Stormwater Drainage System: N/A? ☐ *Sketch flow directions and storm drains on site map*

Type of system: _____.

Does stormwater have ability to flow offsite: Yes ☐ No ☐ **Does stormwater flow into storm drain inlets:** Yes ☐ No ☐

MS4 Connection Yes ☐ No ☐ **Does stormwater come into contact with pollutants before leaving the site** Yes ☐ No ☐

List Potential Pollutants: _____

Existing Structural BMP's: Yes ☐ No ☐ **Condition:** Good ☐ Fair ☐ Poor ☐
Photos: _____
Notes: _____
_____
_____

Appendix C

Stormwater Pollution Prevention Plan (SWPPP)

Operations and Maintenance Plan For
Material Storage Areas, Heavy Equipment Areas, and
Maintenance Areas
2011

THIS SWPPP IS TO BE MADE AVAILABLE TO THE PUBLIC UPON REQUEST to Spokane County Engineering and Roads-Stormwater Utility, 1026 W. Broadway Ave., Spokane, WA 99260, 509-477-3600