

ARTICLE 9: MAINTENANCE

Introduction

The WMO was established to manage and mitigate the impacts of **development** and **stormwater** upon **flooding** and water quality. The management and mitigation of these impacts is completed through an approach of effecting change on a variety of levels: from promoting responsible land use; providing storage; minimizing **impervious areas**; protecting and enhancing **wetlands, floodplains, buffers, and riparian environments**; minimizing **erosion**; and providing **sediment** control (see §103 for a complete listing). Accomplishing these goals requires implementation of onsite **maintenance** and monitoring to ensure that the work is carried out effectively over the life of the project. Through effective **maintenance** and monitoring, and completion of remedial tasks to address issues that arise, the overall goals of the program and permitted projects can be met.

Many of the **maintenance** requirements specified in the WMO are already required by **National Pollutant Discharge Elimination System (NPDES)** General Permits. The **erosion** and **sediment** control requirements in the WMO are generally based on the General **NPDES** Permit for **Stormwater** Discharges from Construction **Site** Activities (General **NPDES** Permit ILR-10). In addition, many of the **maintenance** requirements for each community's **stormwater** management system are covered under the General **NPDES** Permit for **Stormwater** Discharges from Small Municipal Separate **Storm Sewer** Systems (MS4 Permit).

Under the WMO (§900.1), perpetual **maintenance** plans must be prepared and implemented for the following components of every **development**:

- A. **Erosion and sediment control practices;**
- B. **Stormwater detention facilities;**
- C. **Stormwater** collection facilities including both **major** and **minor stormwater systems;**
- D. Volume control facilities;
- E. **Native planting conservation areas;**
- F. **Qualified sewer construction** including service on grease basins, triple basins, and private pre-treatment facilities;
- G. **Wetland mitigation;** and
- H. **Riparian environment mitigation.**

For every development permitted under the WMO, the facilities described in A through H above must be listed on Schedule R. In addition, the location of these facilities must be shown on Exhibit R (Recording Exhibit) along with the applicable maintenance responsibilities and activities. Two copies of Schedule R and Exhibit R should be included with each submittal and four copies of each are due at approval. Exhibit R should be submitted separately from the plans as its own sheet (minimum exhibit size of 11" by 17").

Note: All bold terms contained in this document are defined terms in the WMO. Refer to Appendix A of the WMO or the TGM for the definition of each bold term.

Schedule R is not required for simple sewer connection permits that solely includes a straightforward service connection or private sewer extension to existing **development** (i.e. no new site development). In addition, any municipal owned properties/publicly funded permits do not require Schedule R. One exception to the above would be a permit that involves a **Sole Permittee** status (see **Sole Permitte** section in article 3 of the **TGM** for more information). If a Schedule R is not required for a publically funded school improvement project, for example, then all the appropriate **maintenance** schedules and notes must be included as part of the engineering utility or **maintenance** plan, with additional provisions for all proposed qualified sewers (if applicable) including pretreatment facilities. If a Schedule R is required for a permit, as in the case of a new volume control facility on private property, then all the qualified sewer **maintenance** including pretreatment facilities must also be included on Schedule R and Exhibit R (if applicable).

Table 9.1 lists those project types and the likely type of **maintenance** plan or native vegetation performance standards that may apply. In some cases, the **maintenance** may be a temporary measure during construction, but in most cases the **maintenance** will begin post-construction and will continue permanently with the **development**.

Table 9-1. Summary of Maintenance Plan Requirements

		Duration		Vegetative Performance Standards		Manufactured Device
		During Construction	Post Construction	Lawn, etc.	Native Plants	
A	Erosion and sediment control practices	X	X	-	-	-
B	Stormwater detention facilities	X	X	X	X	X
C	Stormwater collection facilities including both major and minor stormwater systems	X	X	X	X	X
D	Volume control facilities	-	X	X	X	X
E	Native planting conservation areas	X	X	X	X	X
F	Qualified Sewer Construction including service on grease basins, triple basins and private pre-treatment facilities	-	X	-	-	X
G	Wetland mitigation	X	X	-	X	X
H	Riparian environment mitigation	X	X	X	X	X

Plan Requirements and Guidance

The **maintenance** plan should describe inspection, **maintenance**, and monitoring activities that occur after the construction phase and continue, as applicable, into perpetuity. There are three key components to an effective **maintenance** plan:

- 1) A comprehensive list of all **maintenance** tasks that are to be performed for each system (A through H above) and the frequency of each task;
- 2) The responsible party for performing the **maintenance**; and

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- 3) A description of applicable temporary and permanent access and **maintenance** easements granted or dedicated to, and accepted by, a governmental entity.

Guidance for the **maintenance** of the systems listed in items A through H above is included below. Example perpetual maintenance plans and wetland mitigation maintenance and monitoring plans are included at the end of this article.

Erosion and Sediment Control Practices

All **developments** that are greater than or equal to one (1.0) acre in size must comply with the Illinois Environmental Protection (**IEPA**) **NPDES** requirements for construction activities (General **NPDES** Permit ILR-10). However, the WMO requires **erosion and sediment control practices** on all **development sites**, regardless of the area of land disturbance. For every **development**, a **maintenance** plan is required for all temporary and permanent **erosion and sediment control practices**.

The **maintenance** plan should be a schedule of implementation of the **erosion and sediment control** plan including, but not limited to:

- A. A statement that installation of **erosion and sediment control practices** will occur prior to any soil disturbance;
- B. A schedule for construction activities, including **stabilized** construction entrance installation, **sediment** trapping facility installation, **site** clearing, stockpiling, grading, construction waste disposal, temporary and permanent **stabilization**, and removal of temporary **erosion and sediment control practices**;
- C. A schedule for inspection, reporting, and **maintenance** of all **erosion and sediment control practices**; and
- D. Contact information for the party responsible for implementation and **maintenance** of the **site** soil **erosion** and **sediment** control plan.

Onsite inspections should be completed regularly and also after **storm events** that result in 0.5 inches or more rainfall. During these inspections, an assessment should be made on whether the onsite soil **erosion and sediment control practices** are performing properly, as compared to the specifications contained in the plans and/or *Illinois Urban Manual*. Any **maintenance** that is required should also be identified and implemented immediately.

All **erosion and sediment control practices** should be monitored and maintained throughout the duration of construction in accordance with the requirements of §302 of the WMO and General **NPDES** Permit ILR-10. In some cases, perpetual **maintenance** and monitoring of projects, post-construction, is required to ensure the **erosion** and **sediment** control issues that may arise are quickly identified and rectified as necessary (see §310.2). However, in most cases monitoring of the **site** will cease once a Notice of Termination (NOT) has been submitted to

IEPA. All temporary **erosion and sediment control practices** should be maintained until permanent **stabilization** is achieved and then removed within 30 days of **stabilization**.

Maintenance and inspection provisions for erosion and sediment control practices during the construction phase should be provided on the plans in the form of general notes and maintenance/inspection schedules. Figures 9.1 and 9.2 provide examples of general notes for maintenance and inspections, and Figure 9.3 provides an example of an inspection and maintenance schedule.

GENERAL NOTES – MAINTENANCE

THE FOLLOWING IS A DESCRIPTION OF PROCEDURES THAT SHOULD BE USED TO MAINTAIN, IN GOOD AND EFFECTIVE OPERATION CONDITIONS, VEGETATION, EROSION AND SEDIMENT CONTROL MEASURES AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THIS PLAN AND STANDARD SPECIFICATIONS. ALL EROSION CONTROL MEASURES MUST BE MAINTAINED AND IMMEDIATELY REPLACED AS NEEDED AND AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTION, MAINTENANCE, AND REPAIR. THE CONTRACTOR SHALL INSPECT AND COMPLETE MAINTENANCE OF ALL ITEMS A MINIMUM OF EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5-INCH RAINFALL. ALL TEMPORARY EROSION AND SEDIMENT CONTROL ITEMS, INCLUDING PERIMETER EROSION BARRIER, MUST BE REMOVED WITHIN 30 DAYS AFTER FINAL STABILIZATION IS COMPLETED.

STABILIZED CONSTRUCTION ENTRANCE: THE ENTRANCES SHOULD BE MAINTAINED TO PREVENT TRACKING OF SEDIMENT ONTO PUBLIC STREETS. MAINTENANCE INCLUDES TOP DRESSING WITH ADDITIONAL STONE AND REMOVING TOP LAYERS OF STONE AND SEDIMENT. THE SEDIMENT RUN-OFF INTO THE PUBLIC RIGHT-OF-WAY SHOULD BE REMOVED IMMEDIATELY.

RIPRAP OUTLET PROTECTION: RIPRAP SHOULD BE INSPECTED FOR ANY SCOUR BENEATH THE RIPRAP OR FOR STONES THAT HAVE BEEN DISLODGED. SEDIMENT ACCUMULATION IN THE OUTFALL AREA SHOULD BE REMOVED AS NEEDED.

CONCRETE WASHOUT AREA: EXISTING AREAS SHOULD BE CLEANED OUT, OR NEW FACILITIES SHOULD BE CONSTRUCTED AND OPERATIONAL ONCE THE EXISTING WASHOUT IS 75% FULL. WASHOUT SHOULD BE INSPECTED FREQUENTLY TO ENSURE THAT PLASTIC LININGS ARE INTACTS AND SIDEWALLS HAVE NOT BEEN DAMAGED BY CONSTRUCTION ACTIVITIES. WHEN THE WASHOUT AREA IS ADJACENT TO A PAVED ROAD, THE PAVED ROAD SHOULD BE INSPECTED FOR ACCUMULATED CONCRETE WASTE. ANY ACCUMULATED CONCRETE WASTE ON THE ROAD, CURB, OR GUTTER SHOULD BE REMOVED AND PROPERLY DISPOSED.

EROSION CONTROL BLANKET: THE BLANKET AND STAPLES SHOULD BE INSPECTED FREQUENTLY AND SHALL BE INSTALLED TO THE ILLINOIS URBAN MANUAL, UNLESS OTHERWISE INSTRUCTED BY THE MANUFACTURER. EROSION OCCURRING UNDERNEATH THE BLANKET SHOULD BE BACK-FILLED AND SEEDED WITH THE APPROPRIATE SEED MIX. ADDITIONAL BMP'S MAY NEED TO BE INSTALLED TO REDUCE EROSION UNDER THE BLANKET.

SILT FENCE: SILT FENCES SHOULD BE INSPECTED REGULARLY FOR UNDERCUTTING WHERE THE FENCE MEETS THE GROUND, OVERTOPPING, AND TEARS ALONG THE LENGTH OF THE FENCE. DEFICIENCIES SHOULD BE REPAIRED IMMEDIATELY. REMOVE ACCUMULATED SEDIMENTS FROM THE FENCE BASE WHEN THE SEDIMENT REACHES ONE-HALF THE FENCE HEIGHT. DURING FINAL STABILIZATION, PROPERLY DISPOSE OF ANY SEDIMENT THAT HAS ACCUMULATED ON THE SILT FENCE. INSTANCES WHEN AREAS OF SILT FENCE CONTINUALLY FAIL, REPLACE SILT FENCE WITH ANOTHER BMP AS SEEN FIT.

CATCH BASIN AND INLET FILTERS: INLET FILTERS SHOULD BE INSPECTED FOR PROPER FILTERING, IF FILTER BAGS ARE USED, REMOVE SEDIMENT FROM THE FILTER BAGS WHEN 50% OF THE STORAGE VOLUME HAS BEEN FILLED, UNLESS OTHERWISE INSTRUCTED BY THE MANUFACTURER. REMOVE TRASH AND DEBRIS DURING INSPECTIONS. ACCUMULATED MATERIAL IN THE FILTERS SHOULD BE DISPOSED PROPERLY. DO NOT PUNCTURE HOLES IN FILTERS IF PONDING OCCURS.

THE CONTRACTOR OR CO-PERMITTEE WILL ASSUME MAINTENANCE OF FACILITIES FOR THE PROPOSED PROJECT ONCE CONSTRUCTION IS COMPLETE AND THE DISTURBED AREAS ARE STABILIZED.

Figure 9.1. Example General Notes for Maintenance of Erosion and Sediment Control Practices

GENERAL NOTES – INSPECTIONS

THE OWNER SHALL DESIGNATE A QUALIFIED PERSON TO BE RESPONSIBLE FOR SEDIMENT AND EROSION CONTROL OBSERVATION REPORTING. THIS QUALIFIED PERSON SHALL MEET THE REQUIREMENTS NOTED IN THE ILR10 PERMIT CONDITIONS AND/OR THE WMO REGULATIONS. SITE OBSERVATIONS SHOULD OCCUR AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCHES OR GREATER, OR EQUIVALENT SNOWFALL. SITE OBSERVATION REPORTS SHOULD BE MAINTAINED ONSITE AS PART OF THE SWPPP.

EACH SITE OBSERVATION SHALL INCLUDE THE FOLLOWING COMPONENTS:

- A. DISTURBED AREAS AND AREAS USED FOR THE STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE CHECKED FOR EVIDENCE OF, OR POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. THE EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY HAVE BEEN INSTALLED AND ARE OPERATING CORRECTLY. WHERE DISCHARGE POINTS ARE ACCESSIBLE, THEY SHOULD BE CHECKED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT TRACKING TO THE RECEIVING WATERS. LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE SHOULD BE CHECKED FOR OFF-SITE SEDIMENT TRACKING. ALL PUMPING OPERATIONS AND ALL OTHER POTENTIAL NON-STORM WATER DISCHARGES SHOULD BE OBSERVED.
- B. BASED ON THE RESULTS OF THE SITE OBSERVATION, THE DESCRIPTION OF POTENTIAL POLLUTANT SOURCES IDENTIFIED, AND THE POLLUTION PREVENTION MEASURES DESCRIBED IN THIS PLAN SHALL BE REVISED AS APPROPRIATE, AS SOON AS PRACTICABLE AFTER THE OBSERVATION. THE MODIFICATIONS, IF ANY, SHALL PROVIDE FOR TIMELY IMPLEMENTATION OF ANY CHANGES TO THE PLAN WITH 7 CALENDAR DAYS FOLLOWING THE SITE OBSERVATION.
- C. A REPORT SUMMARIZING THE SCOPE OF THE OBSERVATION, NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE OBSERVATION, THE DATE(S) OF THE OBSERVATION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN, AND ACTIONS TAKEN IN ACCORDANCE WITH PARAGRAPH B ABOVE SHALL BE MADE AND RETAINED AS PART OF THE STORM WATER POLLUTION PREVENTION PLAN FOR AT LEAST THREE YEARS FROM THE DATE OF FINAL STABILIZATION OR PERMIT COVERAGE IS TERMINATED. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH PART VI.G (SIGNATORY REQUIREMENTS) OF THE ILR10 NPDES PERMIT.
- D. THE OWNER SHALL NOTIFY THE APPROPRIATE AGENCY FIELD OPERATIONS SECTION OFFICE BY EMAIL AT EPA.SWNONCOMP@ILLINOIS.GOV, TELEPHONE, OR FAX WITHIN 24 HOURS OF ANY INCIDENCE OF NONCOMPLIANCE FOR ANY VIOLATION OF THE STORM WATER POLLUTION PREVENTION PLAN OBSERVED DURING A SITE OBSERVATION, OR FOR VIOLATIONS OF ANY CONDITION OF THE PERMIT. THE OWNER SHALL COMPLETE AND SUBMIT WITHIN 5 DAYS OF INCIDENCE OF NONCOMPLIANCE (ION) REPORT FOR ANY VIOLATION OF THE STORM WATER POLLUTION PREVENTION PLAN OBSERVED DURING AN INSPECTION CONDUCTED. SUBMISSION SHALL BE ON FORMS PROVIDED BY THE AGENCY AND INCLUDE SPECIFIC INFORMATION ON THE CAUSE OF NONCOMPLIANCE, ACTIONS WHICH WERE TAKEN TO PREVENT ANY FURTHER CAUSES OF NONCOMPLIANCE, AND A STATEMENT DETAILING ANY ENVIRONMENTAL IMPACT, WHICH MAY HAVE RESULTED FROM THE NONCOMPLIANCE.
- E. ALL REPORTS OF NONCOMPLIANCE SHALL BE SIGNED BY A RESPONSIBLE AUTHORITY AS DEFINED IN PART VI.G OF THE ILR10 NPDES PERMIT (SIGNATORY REQUIREMENTS).
- F. ALL REPORTS OF NONCOMPLIANCE SHALL BE MAILED TO THE AGENCY AT THE FOLLOWING ADDRESS:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
COMPLIANCE ASSURANCE SECTION
1021 NORTH GRAND AVENUE EAST
POST OFFICE BOX 19276
SPRINGFIELD, ILLINOIS 62794-9276

Figure 9.2. Example General Notes for Inspection of Erosion and Sediment Control Practices

CONTROL MEASURE GROUP	CONTROL MEASURE	APPL.	CONTROL MEASURE CHARACTERISTICS	TEMP.	PERMANT
VEGETATIVE SOIL COVER	TEMPORARY SEEDING	X	PROVIDES QUICK TEMPORARY COVER TO CONTROL EROSION WHEN PERMANENT SEEDING IS NOT DESIRED OR TIME OF YEAR IS INAPPROPRIATE.	X	
	PERMANENT SEEDING	X	PROVIDES PERMANENT VEGETATIVE COVER TO CONTROL EROSION, FILTERS SEDIMENT FROM WATER. MAY BE PART OF FINAL LANDSCAPE PLAN.		X
	DORMANT SEEDING		SAME AS PERMANENT SEEDING EXCEPT IS DONE DURING DORMANT SEASON. HIGHER RATES OF SEED APPLICATION ARE REQUIRED.	X	X
	SOODING		QUICK PERMANENT COVER TO CONTROL EROSION. QUICK WAY TO ESTABLISH VEGETATION FILTER STRIP. CAN BE USED ON STEEP SLOPES OR IN DRAINAGEWAYS WHERE SEEDING MAY BE DIFFICULT.	X	X
	PLANTS, TREES & SHRUBS		PROVIDES GROUND COVER, SHROUS AND TREES IN ADDITION TO PERMANENT VEGETATION. MAY BE USED AS PART OF A FINAL LANDSCAPE PLAN ALONG WITH SHRUBS AND TREES.		X
NON VEGETATIVE SOIL COVER	MULCHING		ADDED INSURANCE OF A SUCCESSFUL TEMPORARY OR PERMANENT SEEDING. CONTROLS COVERED VEGETATION AND PRESERVES MOISTURE. PROVIDES COVER WHERE VEGETATION CANNOT BE ESTABLISHED.	X	X
	EROSION BLANKET	X	PROTECTS THE SOIL SURFACE FROM RAINFALL IMPACTS AND OVERLAND FLOW DURING THE ESTABLISHMENT OF VEGETATION. REDUCES SOIL MOISTURE LOSS DUE TO EVAPORATION.	X	X
	AGGREGATE COVER		PROVIDES SOIL COVER ON ROADS AND PARKING LOTS AND AREAS WHERE VEGETATION CANNOT BE ESTABLISHED. PREVENTS MUD FROM BEING PICKED UP AND TRANSPORTED OFF-SITE.	X	X
	PAVING	X	PROVIDES PERMANENT COVER ON PARKING LOTS AND ROADS IN OTHER AREAS WHERE VEGETATION CANNOT BE ESTABLISHED.		X
DIVERSIONS	RIDGE DIVERSION		TYPICALLY USED ABOVE SLOPES. USED WHEN AN EXCESS OF SOIL IS AVAILABLE.	X	X
	CHANNEL DIVERSION		TYPICALLY USED AT TOP OR BASE OF SLOPES. USED WHEN EXCESS SOIL IS NOT AVAILABLE.	X	X
	COMBINATION DIVERSION		TYPICALLY USED ANYWHERE ON A SLOPE. SOIL TAKEN OUT OF CHANNEL IS USED TO BUILD THE RIDGE.	X	X
	CURB AND GUTTER		SPECIAL CASE OF DIVERSION USED IN CONJUNCTION WITH A STREET TO DIVERT WATER FROM AN AREA REQUIRING PROTECTION.		X
	BENCHES		SPECIAL CASE OF DIVERSION CONSTRUCTED WHEN WORKING ON CUT SLOPES TO SHORTEN LENGTH OF SLOPE AND ADD SLOPE STABILITY.	X	X
WATERWAYS	BARE CHANNEL	X	PROVIDES MEANS OF CONVEYING RUNOFF TO DESIRED LOCATION. MAY BE USED TO OBTAIN INTERSLOPE AREAS. ONLY APPLICABLE WHEN VELOCITY OF FLOW IS VERY LOW.		X
	STRUCTURAL STREAMBANK STABILIZATION		PROTECTS STREAMBANKS FROM EROSION FORCE OF FLOWING WATER		X
	VEGETATIVE CHANNEL		PROVIDES ADDED STABILITY TO CHANNEL. USED WHEN VELOCITY OF FLOW IS NOT EXTREMELY FAST.	X	X
	VEGETATIVE STREAMBANK STABILIZATION		PROTECTS STREAMBANKS FROM THE EROSION FORCE OF FLOWING WATER AND PROVIDES NATURAL, PLEASING APPEARANCE.		X
ENCLOSED DRAINAGE	LINED CHANNEL		USED WHEN VEGETATION WILL NOT PROTECT THE CHANNEL AGAINST HIGH VELOCITIES OF FLOW OR WHERE VEGETATION CANNOT BE ESTABLISHED.	X	X
	STORM SEWER	X	CAN BE USED TO CONVEY SEDIMENT LADEN WATER TO SEDIMENT BASIN OR IN CONJUNCTION WITH A WATERWAY.		X
SPILLWAYS	UNDERDRAIN		USED TO LOWER WATER TABLE AND INTERCEPT GROUNDWATER FOR BETTER VEGETATION GROWTH AND SOIL STABILITY AND TO CARRY BASIC FLOW IN WATERWAYS AND TO DEWATER SEDIMENT BASINS.	X	X
	STRAIGHT PIPE SPILLWAY		USED FOR RELATIVELY SMALL VERTICAL DROPS AND SMALL FLOWS OF WATER.		X
	DROP INLET PIPE SPILLWAY		SAME AS PIPE SPILLWAY EXCEPT LARGER FLOWS AND LARGE VERTICAL DROPS CAN BE ACCOMMODATED.		X
	WEIR SPILLWAY		USED FOR RELATIVELY SMALL VERTICAL DROPS AND FLOWS MUCH GREATER THAN PIPE STRUCTURES.	X	X
OUTLETS	BOX INLET WEIR SPILLWAY		SAME AS WEIR SPILLWAY EXCEPT LARGER FLOWS CAN BE ACCOMMODATED BECAUSE OF LOWER WEIR LENGTH.	X	X
	LINED APRON		PROTECTS DOWNSTREAM CHANNEL FROM HIGH VELOCITY OF FLOW DISCHARGING FROM STRUCTURES.	X	X
SEDIMENT BASINS	EMBANKMENT SEDIMENT BASIN		USED WHERE TOPOGRAPHY LENDS ITSELF TO CONSTRUCTING A DAM AND EARTH FILL IS AVAILABLE.	X	X
	EXCAVATED SEDIMENT BASIN		USED WHERE EMBANKMENT COULD CAUSE A HAZARD DOWNSTREAM IN CASE OF FAILURE AND WHEN EXCESS EARTH FILL IS NOT AVAILABLE.	X	X
	COMBINATION SEDIMENT BASIN		USED WHEN TOPOGRAPHY IS SUITABLE BUT ADDITIONAL CAPACITY IS NEEDED.	X	X
SEDIMENT FILTERS	BARRIER FILTER		USED FOR SINGLE LOTS OR DRAINAGE AREAS LESS THAN 1/2 ACRE TO FILTER SEDIMENT FROM RUNOFF.	X	
	VEGETATIVE FILTER	X	USED ALONG DRAINAGEWAYS OR PROPERTY LINES TO FILTER SEDIMENT FROM RUNOFF. SIZE MUST BE INCREASED IN PROPORTION TO DRAINAGE AREA.	X	X
	FILTER FABRIC	X	USED FOR ROADWAY CURB INLETS.	X	X
MUD AND DUST CONTROL	STABILIZED CONST. ENTRANCE	X	PREVENT MUD FROM BEING PICKED UP AND CARRIED OFF-SITE.	X	X
	DUST AND TRAFFIC CONTROL	X	PREVENTS DUST FROM LEAVING CONSTRUCTION SITE.	X	X

(*) EROSION CONTROL BLANKET SHALL BE PLACED ON ALL DISTURBED AREAS WITHIN 15 DAYS AFTER FINAL GRADE IS REACHED.

INSPECTION AND MAINTENANCE SCHEDULE

ACTIVITY	RESPONSIBLE PARTY	DURATION
STABILIZATION DURING CONSTRUCTION MAINTENANCE	CONTRACTOR	DECEMBER 2005 TO JUNE 2006
STABILIZATION DURING CONSTRUCTION-OBSERVATION	ENGINEER	WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT
VEGETATION MAINTENANCE	CONTRACTOR	1 YEAR FROM COMPLETION
VEGETATION AND STABILIZATION MAINTENANCE	CONTRACTOR	ONGOING FROM CONSTRUCTION COMPLETION

SOIL PROTECTION SCHEDULE

STABILIZATION TYPE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
PERMANENT SEEDING												

PROPOSED SCHEDULE



Figure 9.3. Example Maintenance and Inspection Schedule for Erosion and Sediment Control Practices

Stormwater Detention Facilities

A scheduled perpetual **maintenance** plan is required for all **stormwater detention facilities**, and should include, at a minimum, the following items:

- Planned **maintenance** tasks and frequency of each task such as removal of **sediment**, debris, mowing and pruning of vegetation, and restoration of eroded areas;
- Identification of the responsible parties for performing the **maintenance** tasks; and
- A description of applicable temporary and permanent access and **maintenance** easements granted or dedicated to, and accepted by, a governmental entity.

Maintenance tasks for **stormwater detention facilities** should be performed monthly, at a minimum. The **maintenance** plan for **stormwater detention facilities** should include the following tasks:

- *Debris removal.* Trash, brush, grass clippings, **sediment**, and other debris should be removed from the **detention facility** to maintain the designed storage volume. To prevent clogging, the outlet control **structure** should also be inspected and all debris should be removed.
- *Restoration of eroded areas.* For areas where there is evidence of **erosion**, or in areas where future **erosion** is likely, protection should be provided to prevent further damage. All bare areas should be seeded and restored. Areas located along the side slopes of the **detention facility** will require seeding in conjunction with an **erosion** control blanket.
- *Vegetation control.* If used as a recreational area, the grassed areas of the **detention facility** should be mowed regularly to provide the intended use of the area. Grass clippings from mowing activities should always be collected. Mechanical methods for controlling weeds should be used instead of herbicides and pesticides. In addition, trees should not be allowed to grow along the emergency overflow weir and on any berms that are greater than four feet high. Vegetative control for **detention facilities** that serve as a **wetland** or wildlife habitat area should follow the guidance contained in the **wetland maintenance** plan.

Stormwater Collection Facilities

A perpetual **maintenance** plan for **stormwater facilities** is required. This includes the **major** and **minor** components of the **stormwater system** (other than the **detention facility**), such as **storm sewers**, catch basins, inlets, **outfalls to waterways**, and overland flow routes. A scheduled perpetual **maintenance** plan is required for all **stormwater** collection facilities, and should include, at a minimum, the following items:

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- Planned **maintenance** tasks and frequency of each task such as removal of **sediment**, debris, mowing and pruning of vegetation, and restoration of eroded areas;
 - Identification of the responsible parties for performing the **maintenance** tasks; and
 - A description of applicable temporary and permanent access and **maintenance** easements granted or dedicated to, and accepted by, a governmental entity.

To ensure that **stormwater** collection facilities function as they were designed, regular inspections and **maintenance** of the system should be performed every two weeks. At a minimum, the following **maintenance activities** should be performed:

- *Debris removal.* Trash, wood chips, grass clippings, **sediment**, and other debris should be removed from the catch basins, inlets, **outfalls**, and **storm sewers** to prevent clogging. Cleaning should be done in such a way that the debris is not discharged back into the **stormwater** system.
- *Removal of obstructions.* Inspections should be performed to ensure that all overland flow routes are free from obstructions. If an obstruction has been placed in an overland flow route, it should be removed immediately.
- *Vegetation control.* For grassed swales that serve as overland flow routes, regular mowing should be performed to keep grass at an optimum height (less than six inches). Trees, bushes, and any other non-grass vegetation should be removed to preserve the conveyance capacity of the swale. Any areas of bare soil should be restored immediately using seeding with **erosion** control blanket.

Volume Control Facilities

A perpetual **maintenance** plan for volume control facilities is required. The written plan must include:

- Planned **maintenance** tasks and frequency of each task such as removal of **sediment**, debris, mowing and pruning of vegetation, and restoration of eroded areas;
- Identification of the responsible parties for performing the **maintenance** tasks; and
- A description of applicable temporary and permanent access and **maintenance** easements granted or dedicated to, and accepted by, a governmental entity.

Because every **development** permitted under the WMO is required to incorporate **green infrastructure** into the **site** design, special **maintenance** practices should be developed that ensure that the **green infrastructure** (both **volume control practices** and **flow-through practices**) functions properly over time. For **volume control practices**, monitoring wells are required for every 40,000 ft² of surface area. The monitoring wells should be utilized to determine the water level in the **volume control practice** and verify it is functioning properly.

Without proper **maintenance**, the void spaces in porous pavement and infiltration basins may become clogged with **sediment**, reducing their effectiveness. To prevent clogging in the void space of pervious pavement (concrete, asphalt, pavers), it is recommended that adjacent landscaped areas be designed such that **stormwater runoff** from these areas onto the porous pavement is minimized. In addition, low pressure power washing and vacuuming of the surface is recommended on a yearly basis. This **maintenance** is especially critical during the fall. High pressure washing should be avoided for these types of surfaces, as it can cause damage to the pavement. Proper **maintenance** is especially difficult for pervious pavers, because extra care must be taken so that power washing and vacuuming does not dislodge the small chips that are used to fill in the paver gaps. In addition, small debris can collect in the paver gaps and lead to weed growth.

For infiltration trenches and basins, the use of a mulch layer above the infiltration practice will work like a filter for the **sediment** transported by **stormwater runoff**. The mulch layer will need to be replaced when it is filled, but will protect the void spaces in the soil and aggregate layers below from **sedimentation**. An alternative to using a mulch layer is the installation of a **sediment** trap upstream of the infiltration area. The **sediment** trap is a small depression that captures **stormwater** and allows the **sediment** to settle before it reaches the infiltration basin. For the **sediment** trap to be effective, the collected **sediment** must be removed regularly.

For mechanical **flow-through practices**, such as an oil and grit separator, an effective **maintenance** plan is based on performing frequent inspections. The rate at which these devices collect pollutants will vary from **site** to **site**, and therefore frequent inspections (once per month) should be performed to ensure the system is functioning properly. The **maintenance** for these devices should be performed in accordance with the manufacturer's recommendations. As an example, the inspection and **maintenance** guide for the CDS system, which was developed by Contech Construction Products, Inc., is available on-line at:

<http://www.conteches.com/products/stormwater-management/treatment/cds.aspx#1822141-technical-info>

Qualified Sewer Construction

A perpetual **maintenance** plan is required for all **qualified sewer construction**. The written plan must include, at a minimum:

- Planned **maintenance** tasks and frequency of each task for the removal of objectionable wastes, fats, oils and grease, or any **other wastes** collected in private pre-treatment or separator **structures**;
- Planned routine **maintenance** for all private lift station and pumping facilities;
- Operation **maintenance** agreements for all private **service sewers** providing service to multiple **owners**;

- A description of applicable temporary and permanent access and **maintenance** easements granted or dedicated to, and accepted by, a governmental entity.

The **maintenance** for **sanitary sewer** systems should follow the guidance provided in document, Separate **Sanitary Sewer** Collection System Operation and **Maintenance** Manual for Local Agencies Tributary to the Metropolitan Sanitary **District** of Greater Chicago. This operation and **maintenance** guide was developed by Metcalf and Eddy, Inc. in 1989 on behalf of the **District** and is available on-line through the **District's** website at:

<https://www.mwrd.org/iri/portal/anonymous/Infiltration>

Private pre-treatment and separator **structures** that collect objectionable wastes, fats, oils and grease, or any other undesirable waste should be inspected and, if necessary, maintained every two weeks. **Maintenance** of these **structures** is usually performed by permitted haulers or recyclers, and consists of removing the material and then disposing of the material in accordance with local, State, and Federal laws.

To prevent stoppages in gravity sewers, sewer cleaning should be performed on a preventative basis. A regular cleaning schedule for sewers should be developed such that 100% of the pipes are cleaned annually. Some pipe sections may be prone to stoppages and may require more frequent cleaning, such as every month. Other pipe sections may not be susceptible to stoppages and therefore can be cleaned annually. The cleaning schedule should be customized based on information obtained during regular inspections of the system. When cleaning the sewer system, there are both hydraulic cleaning methods and mechanical cleaning methods available. Hydraulic methods utilize high-velocity water to clean the bottoms and walls of the pipes, whereas mechanical methods use equipment to physically remove the material from the bottoms and walls of the pipes.

Planned routine **maintenance** for all private lift station and pumping facilities should be based on the manufacturer's recommendations. The schedule of **maintenance activities** can be supplemented by information obtained during the regular inspections of the equipment. At a minimum, the **maintenance activities** and frequency should meet the manufacturer's recommendations.

Wetland Mitigation and Native Planting Conservation Areas

Maintenance plans must be prepared for **wetland mitigation** and **native planting conservation areas**. The plans shall cover the short term and long term (perpetual) **maintenance**. The short term plans will have set time frames based on the following examples. Actual timeframes will vary based on the complexity or difficulty of the project. The timeframes set a project length of the program; however, failure to meet the performance standards listed in the plan can extend the period until the project is approved. Long term plans are perpetual and intended to maintain the level of quality achieved during the short term period.

Short Term **Maintenance** Plan Example Timeframes:

- Temporary Impact Minimal Restoration, e.g. utility line installation - 1 year
- Enhancement/restoration of an existing area (more than minimal) - 3 years
- **Wetland Mitigation** - 5 years

The contents of the Short Term Plan are as follows:

- Proposed **wetland hydrology** and an inundation and duration analysis;
- Proposed soils and soil management activities;
- Proposed planting zones, species, quantities, sizes, locations, specifications, methodologies, and details;
- Proposed **maintenance** and monitoring plan with **maintenance activities** and performance criteria outlined;
- Schedule of earthwork, planting, monitoring, and **maintenance**; and
- A description of applicable temporary and permanent access and **maintenance** and conservation easements granted or dedicated to and accepted by a governmental entity.

The contents of the Long Term Plan are as follows:

- A plan for the continued management, operation, and **maintenance** of the **wetland mitigation** measures including the designation of funding sources and the **person** responsible for long-term operation and **maintenance**.

Riparian Environment Mitigation

Maintenance plans must be prepared for **riparian environments**. The plans shall cover the short term and long term (perpetual) **maintenance**. The short term plans will have set time frames based on the following examples. Actual timeframes will vary based on the complexity or difficulty of the project. The timeframes set a project length of the program; however failure to meet the performance standards listed in the plan can extend the period until the project is approved. Long Term plans are perpetual and intended to maintain the level of quality achieved during the short term period.

Short Term **Maintenance** Plan Example Timeframes:

- Temporary Impact Minimal Restoration, e.g. utility line installation - 1 year
- Mitigation/Enhancement/Restoration of an existing **riparian environment** - 3 years

The contents of the **Riparian** Short Term Plan are as follows:

- Proposed **wetland hydrology** and an inundation and duration analysis;
- Proposed soils and soil management activities;
- Proposed planting zones, species, quantities, sizes, locations, specifications, methodologies, and details;
- Proposed **maintenance** and monitoring plan with **maintenance activities** and performance criteria outlined;
- Schedule of earthwork, planting, monitoring, and **maintenance**;

- A plan for the continued management, operation, and **maintenance** of the **wetland mitigation** measures including the designation of funding sources and the **person** responsible for long-term operation and **maintenance**.

As applicable, the following shall also be included in the **maintenance** plan discussion.

- A description of applicable temporary and permanent access and **maintenance** and conservation easements granted or dedicated to and accepted by a governmental entity;
- The proposed naturalizing methods, such as meandering, pools, or riffles for relocated channels. Methods proposed are expected to be able to withstand all events up to the **base flood** without increased **erosion**;
- The methods by which the normal flow within the channel will be diverted to construct the new or relocated channel;
- The **erosion and sediment control practices** to be implemented;
- The appropriate hydrologic and hydraulic methods analyzing the impacts on **flood** flows and **flood** elevations (to be provided in the **floodplain** and **floodway** submittal) meeting all other requirements in the **Ordinance**, including the **floodplain** and **floodway** requirements outlined in §601 and §602 of the **Ordinance**;
- Proposed planting zones, species, quantities, sizes, locations, specifications, methodologies, and details;
- Scheduling of earthwork, planting, **maintenance**, and monitoring; and
- A description of applicable temporary and permanent access and **maintenance** and conservation easements granted or dedicated to, and accepted by, a governmental entity.

Wetland, Buffer, Riparian, and Native Planted Areas Maintenance & Monitoring Plan Format

The WMO describes within §310 (**Maintenance** and Monitoring Plan Submittal) the required contents of the submittals for each of the **site** elements listed above. However, the WMO does not provide any specific guidance or criteria regarding performance standards or format of the document. Recommendations regarding the type of **maintenance** and monitoring plan to prepare and recommended performance standards regarding certain project elements are described below.

It is recommended that **maintenance** and monitoring plans be prepared following Adaptive Management Principles. **Maintenance** and monitoring plans will be tailored to suit the needs of each **development**. Applicants will be required to determine the applicability of each element and complete the required **maintenance** and monitoring in accordance with the approved plan.

Adaptive Management is a **structured** approach for addressing uncertainties by adjusting implementation, as necessary, to improve the probability of success. Adaptive management is seen as an evolving process involving learning (the accumulation of understanding over time) and adaptation (the adjustment of management over time). The sequential cycle of learning and adaptation leads naturally to two beneficial consequences:

1. Better understanding of the resource system being managed, and
2. Better management based on that understanding.

Adaptive Management Goals and Objectives

Plans are designed to be adaptive to changing **site** conditions observed through periodic monitoring of the **site**. The monitoring visits are important to determine the annual tasks needed. Those tasks are then completed and evaluated for effectiveness. New tasks are then defined as necessary to achieve the project goals and objectives.

Plan:

- Identify management issues (e.g. weed infestations)
- Identify management goals (e.g. weeds managed, native seeding);
- Determine management strategies available (e.g. herbicide, hand pulling, burning);
- Select appropriate management action (e.g. hand removal);
- Determine what will be monitored and how (e.g. establish a fixed point in field); and
- Determine how change and success will be evaluated (e.g. absence of weeds one month or one year after removal).



Do:

- Carry out action (e.g. remove weeds, complete prescribed burn).

Monitor:

- Monitor results (e.g. revisit **site** to determine success of activities).

Review:

- Assess previous management strategy and modify plan as necessary to adapt to current **site** conditions; and
- Return to Planning – begin again, adapt to new **site** conditions.

Recommended Native Seeding Planting Performance Standards

For **wetland**, **riparian**, buffer, and **stormwater** areas proposed to contain native seeding or planting, the following minimum performance standards shall apply. Applicants may offer alternative standards for unique situations.

1. For projects which have or will receive a permit from the **US Army Corps of Engineers (Corps)**, applicants should follow the most current version of the *Chicago District Permittee Responsible Mitigation Requirements* to the mitigation areas for **wetland**, buffer, and **riparian environments**. The guide is available on-line through the **Corps** website at:

<http://www.lrc.usace.army.mil/Missions/Regulatory/MitigationRequirements.aspx>

2. For projects that do not have to receive a **Corps** permit, applicants should at a minimum achieve the following standard:
 - At least 80% of the vegetation present within the planted **wetland** and buffer restoration area shall be native, non-invasive species. This standard does not apply to emergent communities or existing previously vegetated areas that are not undergoing restoration or are lawn.

Maintenance Plan Implementation

As specified in the WMO (§900.4), **maintenance** is the responsibility of the **co-permittee** and **permittee** of the **development**. The **maintenance** responsibility may be delegated to an entity that is acceptable to the **permittee**, however, ultimate responsibility for the **maintenance** of the facilities lies with the **permittee**.

Maintenance plans may be modified if **site** conditions change or issues arise, however, the **District** or **authorized municipality** has discretion as to whether or not to accept the requested modification.

EXAMPLE MAINTENANCE PLAN FOR EXHIBIT R (RECORDING EXHIBIT)

The Owner of the XYZ Development, with facilities as shown on Exhibit R, shall assume responsibility for the following perpetual maintenance activities:

1. General

Regular inspections and routine maintenance of general areas shall be performed on a monthly or as-needed basis. Specific items of concern include:

- Litter and debris shall be controlled
- Landscaped areas shall be maintained with regular mowing and restored with appropriate seeding/vegetation as necessary
- Accumulated sediment shall be disposed of properly, along with any wastes generated during maintenance operations
- Riprap areas shall be repaired with the addition of new riprap, as necessary, of similar size and shape
- Roads shall be swept, vacuumed and/or washed on a regular basis

2. Stormwater Management Facilities

All components of the stormwater management facilities shall be checked monthly between March and November and maintained as necessary to ensure proper performance. It is critical that all inflows and outflows to the detention facility are clean and performing as designed. In addition, the design volume of the detention facility shall also be maintained. Inspections for the following specific items should be conducted monthly between March and November:

Side Slopes/Embankment/Emergency Overflow Structure

- Inspect embankments for settlement and erosion
- Remove woody growth from the embankment
- Any breaks, hire Registered Professional Engineer for design resolution
- Seed and sod any eroded areas
- Signs of piping (leakage), repair
- Signs of seepage or wet spots on the downstream face of a berm, may require toe drains or chimney drains to solve problems
- Stabilize emergency overflow structure if erosion observed
- Remove obstructions blocking emergency overflow spillway

Vegetated Areas

- Regular mowing to control vegetation, no cutting of native vegetation
- Need for planting, reseeding or sodding. Supplement alternative native vegetation if a significant portion has not established (50% of the surface area). Reseed with alternative grass species if original grass cover has not successfully established.
- Evidence of grazing, motorbikes or other vehicles, repair
- Check for invasive vegetation, remove where possible
- All vegetation must be maintained per the approved planting plan

Outlet Control Structure

- Inspect restrictor and remove debris if clogged or discharge reduced
- Remove accumulated sediment at outlet
- Scour and erosion at outlet, repair and reseed
- Any ice damage to outlet of pipe, repair if necessary
- Condition of trash tracks, remove debris
- Outlet channel conditions downstream

Access for Maintenance Equipment

- Remove any obstructions placed in maintenance easements

Safety Features

- Access controls to hazardous areas
- Fences
- Loose or damaged posts
- Loose or broken wires
- Accumulated debris in fences
- Condition of gates
- Signs

Detention Volume

- Inspect all stormwater detention facilities to ensure that the constructed volume for detention is maintained. No sediment, topsoil, or other dumping into the facility shall be allowed. Specific locations in the stormwater management system, designed to accumulate sediment, shall be dredged as necessary to prevent sediment from reaching the invert of any gravity outlet pipe.

3. Volume Control Facility

Routine inspections and maintenance of volume control facilities shall be performed by the Owner on a yearly or as-needed basis. Specific items of concern include:

- Facility shall be inspected yearly using the monitoring well to verify the system is functioning properly.
- Surface of permeable pavement shall be cleaned with a low-pressure power washer.
- Accumulated sediment from surface shall be vacuumed out and disposed of properly.
- Appropriate signage shall be repaired if damaged or illegible.

4. Stormwater Collection System

The Owner shall perform monthly inspections of all components of the stormwater collection system. The monthly inspection shall occur between March and November and include the following specific areas of concern:

Storm Inlets/Manholes

- Remove accumulated leaves and other debris from grates

- ___ Reset covers/lids on as-needed basis
- ___ Remove accumulated sediment from bottom of manhole when 50% of sump is filled

Storm Sewers/Culverts

- ___ Visually inspect pipes by removing manhole lids, make repairs as necessary
- ___ Storm sewers and culverts shall be checked for siltation deposits at inlets, outlets, and within the conduit, clean out as necessary
- ___ Restore riprap at outfalls if erosion observed
- ___ Restore riprap at outfalls
- ___ Replant and reseed any eroded areas

Overland Flow Routes (Ditches/Swales)

- ___ Annual visual inspections shall be performed that verify the design capacity of the overland flow routes is maintained. The slope and cross-sectional area of the ditch/swale shall be verified during this inspection.
- ___ Remove any obstructions that have been placed in the drainage path
- ___ Seed and sod any eroded areas
- ___ Restore riprap as necessary
- ___ Regrade to provide positive drainage as necessary (A Professional Land Surveyor may be required to check grades to ensure positive drainage).
- ___ Regular mowing to control vegetation
- ___ Rototill bottom of dry swales if not drawing down within 48-hours

5. Vegetated Areas

- ___ Need for planting, reseeding, or sodding. Supplement alternative native vegetation if a significant portion has not established (50% of the surface area after second growing season). Reseed with alternative native grass species if original grass cover has not successfully established.
- ___ Evidence of grazing, motorbikes, or other vehicles, repair.
- ___ Check for invasive vegetation, remove when possible.
- ___ Regular mowing to control vegetation; it is recommended that native vegetation remain uncut.
- ___ Dead or damaged non-native grassy areas – repair with seeding with fertilization or seeding with mulch.
- ___ Compensatory storage area shall be reseeded with appropriate vegetation according to the approved planting plan.

6. Qualified Sewer Construction

- ___ Perform manhole inspections once every five years, make repairs as necessary.
- ___ Perform sewer inspections once every five years, make repairs as necessary.
- ___ Perform regular sewer cleaning so that every sewer segment is cleaned once every five years.
- ___ Remove any obstructions placed in maintenance easements that may impede maintenance equipment access.

SAMPLE - WETLAND MITIGATION

5 YEAR MANAGEMENT AND MONITORING PLAN

DATE

PREPARED FOR:

(USACE Application No. LRC-XXXX)
(XYZ Project No. XX-XXXX)

Introduction

The (OWNER) will implement a 5-Year Wetland Management and Monitoring Plan for the wetland mitigation and natural areas within the _____ project area. The purpose of this Wetland Management and Monitoring Plan is to define the responsibilities of OWNER in regards to the wetland mitigation and restoration.

The success or failure of the project is largely dependent upon completion of maintenance and monitoring during the five-year management program. The following Wetland Management and Monitoring Plan includes a schedule describing Wetland Mitigation Performance Standards and Reporting and Compliance requirements.

Vegetation Performance Standards

The following Ecological Performance Standards apply to USACE wetland restoration and enhancement areas, and associated buffer that are providing wetland mitigation credit. The limits of these combined areas are shown on the attached map and identified as "USACE REGULATED WATERS, WETLAND, AND BUFFER LIMITS".

1. A temporary cover crop shall be planted on all slopes immediately upon completion of any earthwork to prevent soil erosion. Soil erosion and sediment control measures shall be in place during all construction work. An erosion control blanket may also be required depending on site conditions and season of planting. Within three (3) months, at least 90% of this area, as measured by aerial coverage, will be vegetated. If the desired long-term slope vegetation is not planted with the temporary crop, it shall then be planted in the first available growing season appropriate for each plant community. All cover crop species shall be non-persistent or native and not allelopathic.
2. Species selected for the planting shall be native to the county where the mitigation site is located (ref. Swink and Wilhelm, Plants of the Chicago Region, 1994), and shall be appropriate for the hydrologic zone to be planted.
 - **Marsh**- minimum of 15 native perennial species
 - **Sedge meadow/wet prairie**- minimum of 35 native perennial species
 - **Mesic Prairie** (buffer) - minimum of 25 native perennial species

3. At least 50% of the required minimum number of species shall occur at a 10% frequency or greater, within each plant community zone or area. Multiple transects within a given plant community may be combined for this frequency analysis.
4. A native mean coefficient of conservatism value (native mean C value) of greater than or equal to 3.5 shall be achieved in each separate vegetated plant community (e.g. wet prairie, marsh, mesic prairie buffer), and as measured over the entire mitigation site area. Native plant species coefficients of conservatism are designated in Swink, Floyd and Gerould Wilhelm, Plants of the Chicago Region (Indianapolis: Indiana Academy of Science, 4th edition, 1994).

Interim Yearly Standards:

- a. By the end of the first full growing season, at least 30% of the vegetation present within the planted wetland and buffer restoration area shall be native, non-invasive species. This standard does not apply to emergent communities or existing previously vegetated wetland or buffer.
 - b. By the end of the second full growing season, at least 50% of the vegetation present within the planted wetland and buffer restoration area shall be native, non-invasive species. This standard does not apply to emergent communities or existing previously vegetated wetland or buffer.
 - c. By the end of the third full growing season, at least 60% of the vegetation present within the planted wetland and buffer restoration area shall be native, non-invasive species. This standard does not apply to emergent communities or existing previously vegetated wetland or buffer.
 - d. By the end of the fourth and fifth full growing seasons, at least 80% of the vegetation present within the planted wetland and buffer restoration area shall be native, non-invasive species. This standard does not apply to emergent communities or existing previously vegetated wetland or buffer.
5. The native floristic quality index value (native FQI) shall be greater than or equal to 20 in each separate vegetated community zone and as measured over the entire mitigation site. The floristic quality assessment method is described in Swink and Wilhelm, Plants of the Chicago Region.

Steps # 4 and #5 are evaluated based upon the overall plant community inventories as well as transect summaries. If a portion of the site has achieved compliance with the performance standards, the standard shall be maintained in that portion until the final compliance sign off for the mitigation site.

6. No area over the entire mitigation site greater than 1 square meter shall be devoid of vegetation, as measured by aerial coverage, unless specified on approved mitigation plans. This standard does not apply to emergent, streamside and aquatic communities.
7. None of the three most dominant plant species in any of the wetland community zones may be non-native species or weedy species, including but not limited to:
 - *Typha angustifolia*
 - *Typha X glauca*
 - *Phragmites australis*
 - *Lythrum salicaria*
 - *Salix interior*
 - *Phalaris arundinacea*

These species shall not cumulatively comprise more than 5% of the total percent cover (not relative cover) for each planted restored community. This standard does not apply to existing emergent wetland, streamside and aquatic communities or enhancement areas.

8. The native perennial species within each wetland plant community shall represent at least 80% of the total dominance measure. A lower percent native perennial species of the total dominance measure may be acceptable if it is demonstrated with transect data that the remaining dominance percentage is by native annual and biennial wetland plant species and the FQI and mean C standards are exceeded.
9. A vegetation map of the mitigation site based on as-built drawings developed at the completion of implementation shall be submitted. This information shall be descriptive and define the limits of all vegetation areas by community type, based on field observations. The permanent transects shall be shown on this map. Representative photographs of each vegetation area by general community zone shall be submitted to the Corps.

Hydrology Performance Standards

Consistent with the Corps of Engineers Wetlands Delineation Manual (1987) and/or any appropriate regional supplements, all areas to receive credit as wetland plant communities shall have soils saturated within 12 inches or less of the ground surface for at least 12.5% of the growing season as defined in this ICA. To meet this standard the mitigation site shall demonstrate inundated or saturated soils for 23 consecutive days during the growing season. In addition to this minimum, hydrology data should reflect a hydrologic regime that is appropriate to the native plant community proposed for establishment.

Monitoring Standards

Monitoring and data collection are intended to assess whether the mitigation has attained the following performance standards for full credit release and certification. Monitoring is required for five (5) years from the completion of planting of the wetland area. It shall also be recognized that monitoring may need to continue beyond the five (5) year period until full performance standards are attained. This may be especially true for forested communities with a longer growing time to maturity.

Wetland Delineation

To meet full performance standards, a routine wetland delineation shall be performed to verify the total acreage of wetlands and waters achieved on site. If requested by the Corps, the wetland areas shall be staked for final inspection. The Corps may request that the property boundaries for the mitigation site shall be marked as well. The delineation shall be included/reported in the final monitoring report, if not before. It is recognized that the actual acreage of aquatic resources/wetland will vary from that in the plans; however, it shall approach or exceed the acreage specified in the permit.

Vegetation Monitoring

Permanent straight line sampling transects shall be established, plotted onto project drawings and a current aerial photograph of the site, across each proposed plant community of the mitigation site. Sufficient transects shall be established to provide full representation of all plant communities within the site, which might include more than one of each type. Each transect shall consist of a series of 1.0 square meter quadrats (no fewer than 10) at regular or random intervals (5-10m suggested interval). The number of quadrats depends on system complexity and the size of each plant community for which credit is sought. A rough guideline is 2 quadrats per acre in each plant community as a minimum. The plant sampling shall be done in May/June and August/September each year following the initial planting, throughout the monitoring period. Data shall be reported by plant community, and by transect. A total plant species list should be compiled over the entire site for which credit is sought. Data may be summarized by plant community for which credit is sought in monitoring reports, however, the full sampling data should be provided in an appendix to the annual monitoring report. Species dominance shall be determined by calculating importance values, with at least the following two parameters: frequency and percent cover. Absolute percent aerial cover data should be reported, though the frequency and cover may be relativized to calculate Importance Values (e.g. $RF + RC = IV$).

Monitoring Reports

1. The Chicago District shall determine the information to be included in monitoring reports. This information shall be sufficient for the Chicago District to determine how the compensatory mitigation project is progressing towards meeting its performance standards,

and may include plans (such as as-built plans), maps, and photographs to illustrate site conditions. Monitoring reports may also include the results of functional, condition, or other assessments used to provide quantitative or qualitative measures of the functions provided by the compensatory mitigation project site.

2. The permittee or sponsor is responsible for submitting monitoring reports in accordance with the special conditions of the DA permit or the terms of the instrument. Failure to submit monitoring reports in a timely manner may result in compliance action by the Chicago District.
3. Monitoring reports shall be provided by the Chicago District to interested federal, tribal, state, and local resource agencies, and the public, upon request.

Adaptive Management

1. If the compensatory mitigation project cannot be constructed in accordance with the approved mitigation plans, the permittee or sponsor shall notify the Chicago District. A significant modification of the compensatory mitigation project requires approval from the Chicago District.
2. If monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated, the responsible party shall notify the Chicago District as soon as possible. The Chicago District will evaluate and pursue measures to address deficiencies in the compensatory mitigation project. The Chicago District will consider whether the compensatory mitigation project is providing ecological benefits comparable to the original objectives of the compensatory mitigation project.
3. The Chicago District, in consultation with the responsible party (and other federal, tribal, state, and local agencies, as appropriate), will determine the appropriate measures. The measures may include site modifications; design changes, revisions to maintenance requirements, and revised monitoring requirements. The measures shall be designed to ensure that the modified compensatory mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives.
4. Performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. No other revisions to performance standards will be allowed except in the case of natural disasters.

Long Term Management

1. The applicant shall submit a long term management strategy with an associated financial assurance plan for Chicago District approval prior to authorization. The strategy shall include a description of long-term management needs, annual cost estimates for those needs, and identify the funding mechanism that will be utilized to meet the needs. The applicant shall also identify the entity responsible (and provide supporting documentation, e.g. agreement or letter of intent) for the ownership and long-term management of the site. Identifying the responsible entity prior to permit issuance will aid in the processing of the instrument. It is preferred that the proposed long term manager or organization have expertise in executing adaptive management procedures. Applicants shall establish agreements for long-term management with public or private conservation organizations with final approval of the Chicago District.
2. All land, including associated uplands, which are part of the mitigation site shall be protected from future development by a permanent conservation easement, deed restriction or other real estate instruments as deemed appropriate by the Chicago District. This easement or deed restriction, along with a map of the site, shall be recorded with the appropriate county register of deeds, attached to the abstract of title, with a certified copy of the registration provided to the Chicago District prior to authorization.

Compliance Signoff

The Chicago District will issue final approval at the end of the management and monitoring period if the mitigation is in compliance and the Long Term Manager has been established for the site. The Long Term Manager shall provide supporting documentation stating their acceptance of the site in perpetuity. To be successful, the mitigation shall demonstrate the characteristics specified in the approved mitigation plan, the stated goals, and the Mitigation Requirements. Failure to comply with all the terms and conditions of a Department of the Army permit, including the mitigation plan and Mitigation Requirements, at any time may result in suspension and/or revocation of the permit and additional enforcement actions. The Corps may issue early compliance signoff if the required performance standards have been met. If the mitigation fails, the permittee will be required to determine the cause of the failure and to correct the error at the mitigation site, or to conduct additional mitigation activities.

The TOLLWAY shall also be responsible for successful completion and submittal of the required Special Condition project documentation to the Illinois Environmental Protection Agency, as listed in Item Number 8 of the IEPA October 16, 2013, Water Quality Certification.

REFERENCES

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