

**STORM WATER POLLUTION PREVENTION PLAN
(SWPPP)**

**Residential/Commercial Subdivision Development
Horizon Shores First Addition
City of Moorhead**

Location:

South of 12th Avenue South and East of 34th Street South
W ½ of NE ¼ of Section 15, Township 139N, Range 48W

May 20, 2005

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MINNESOTA GENERAL STORM WATER PERMIT FOR CONSTRUCTION
ACTIVITY (MN R100001)

INSPECTION LOG

1. Introduction

- a. The purpose of this SWPPP is to provide the following:
 - i. Define the characteristics of the site and the type of construction that will occur.
 - ii. Describe the site plan for the planned construction.
 - iii. Describe practices to be implemented to control erosion and prevent the release of pollutants into storm water.
 - iv. Establish an implementation schedule that ensures the effectiveness of planned practices to reduce erosion, sediment and pollutant levels in storm water discharged from the site.
 - v. Describe the final stabilization practices and maintenance responsibilities allowing for termination of this permit.

- b. SWPPP Content
 - i. Identification of the SWPPP coordinator and description of duties.
 - ii. Identification of the storm water pollution prevention team that will assist in implementing the SWPPP during construction.
 - iii. Description of existing site conditions including existing land use and any nearby Waters of The State.
 - iv. Identification of the receiving water body for runoff from this project.
 - v. Identification of drainage area and potential storm water contaminants.
 - vi. Description of storm water management controls and BMPs necessary to prevent or reduce erosion, sediment and pollutants in storm water discharge from this site.
 - vii. Description of project monitoring and how BMPs will be coordinated with construction activities.
 - viii. Implementation schedule and provisions for amendments to the plan.

2. SWPPP Coordinator and Duties

The City of Moorhead will make Application for General Storm Water Permit for Construction Activity (MN R100001) and be listed as "Owner" for the purposes of permit application. The City will continue that role until the Underground Utilities and Street Paving Projects are complete. During that period, "Permit Transfer Modifications" will be submitted to assign "Contractor" responsibilities as co-permittee for the appropriate project work.

Following completion of street paving, installation and acceptance of the grass filter strips adjacent to the curb lines, the City will complete a "Permit Transfer Modification" transferring the "Owner" designation and responsibilities to the Developer during housing construction. At that time, the City and its Contractor's are no longer responsible for the permit or best management practices in place.

The City will retain ownership and maintenance responsibility for any sedimentation basins and storm water structures constructed as part of the project.

The responsibility for BMP maintenance of filter strips and inlet protection will be Developer's until the area meets the 70 percent cover requirement of the NPDES permit. The developer will be responsible for informing the individual lot owners/home builders of their responsibility to submit "Subdivision Registration" forms to MPCA and terminating his responsibilities as project owner per the terms of the permit.

A construction site SWPPP Erosion Control (EC) Supervisor will be provided by the respective Underground Utility and Street Paving Contractors during construction activities and until their responsibilities have been transferred or terminated under terms of the MPCA Permit. The EC Supervisor will be identified by name at the pre-construction conference, and a contact cell phone number will be made available. The EC Supervisor will address issues that arise during construction that impact the waters of the State of Minnesota. The Supervisor will notify the proper regulatory officials as listed below:

<u>Agency</u>	<u>Permit</u>	<u>Name</u>	<u>Phone #</u>
State Duty Officer	MPCA		800-422-0798
MPCA Detroit Lakes	MPCA	Joyce Cieluch	218-847-1519
City of Moorhead Project Eng		Thomas Trowbridge	299-9390
City of Moorhead Storm Water		Bob Fogel	979-9513
		<i>Andy Bradshaw</i>	<i>218-299-5386</i>

It will be the responsibility of the respective Contractor's EC Supervisor to implement the SWPPP during construction and maintain a quality control program. This includes BMPs undertaken by previous Contractors as part of the SWPPP. The EC Supervisor will:

- a. Oversee maintenance practices identified as BMPs in the SWPPP.
- b. Implement SWPPP and BMP training for all parties involved in the construction.
- c. Inspect or monitor activities related to the SWPPP as needed.
- d. Identify additional potential sources of pollutants not included in the SWPPP and take appropriate action to add them to the plan.
- e. Ensure that any changes made to construction plans are consistent with the goals of the SWPPP.
- f. To aid in the implementation of the SWPPP, random site visits will occur by the design team as well as an inspector on-site.

3. Facility Description

a. Site Location

The project is located southeast of the intersection of 12th Avenue South & 34th Street South in the NE ¼ of Section 15, Township 139N, Range 48W

Figure 1 (Attached at the end of this document) is a US Quad Map showing the project location.

Figure 2 (Attached at the end of this document) is an area map showing the project location.

b. Construction Type

This is a residential subdivision construction project. Sanitary and storm water sewer systems will be installed. Streets with curb and gutter will be constructed and paved. Homes and driveways will be constructed. A permanent storm water sedimentation pond will be built to treat storm water from the proposed subdivision.

c. Existing Site Conditions (from Feasibility Study April 2005)

i. Land Use / Zoning

The site was originally used for agricultural purposes and has been annexed into the City of Moorhead. The area was initially zoned TZ, Transition District, which is intended to provide interim zoning regulations until development occurs. According to information taken from the City of Moorhead and Clay County websites, the site has been rezoned CC, RLD and RMD to accommodate for commercial, low density residential and medium density residential developments.

ii. Soil and Groundwater Conditions

According to the Clay County GIS Geodatabase, the predominant soil types in the project area are Bearden silty clay loam and Colvin silty clay loam. These soils generally have moderately poor to poor drainage, shallow seasonal high water tables and low strength. Typically, these soils present a high risk of corrosion to uncoated steel pipe, and low risk of corrosion to concrete.

A total of 9 soil borings were performed by Midwest Testing Laboratory in April of 2004. These borings indicate that there are brown and light-gray, loose water-bearing silt layers with fat clay layers above and below the silt. The silt layer varies from 8' to 14' below the surface and averages approximately 4' in depth. The gray fat clays found below depths of approximately 14 feet have moisture contents typically ranging from 50 to 80 percent. These fat clays also have relatively low unconfined compressive strengths ranging from 400 to 900 psf. The results also indicate that the estimated

ground water level varies from an elevation of 899 to 902. Surface elevations prior to the pond construction ranged from 907 to 909.

d. Site Plan

Figure 3 Consists of site plan sheets showing project boundaries, existing roadways, proposed roadways, ditches, storm system inlets, proposed erosion and sediment control measures, and proposed pond location for the 63.3-acre development.

(From Feasibility Study April 2005

It is proposed to construct a 108 lot low density residential development plus 3 lots containing medium density residential housing and a single lot for commercial property along 12th Avenue south. Right-of-way for 34th Street and 24th Avenue South will be 120' and 80' respectively. The new interior streets have been platted with dedicated right of way varying from 60' to 80' depending on the street width, parking and type of use.

A large detention pond has been constructed next to the east perimeter of the development. The first phase of this master-planned pond (East Regional Storm Water Detention Pond) has been sized to receive storm water from Horizon Shores First addition along with other future development to the east and south. The first phase of construction was signed to accommodate run-off from 171 acres of developed land and 723 acres of agricultural land.

The Horizon Shores First Addition storm sewer improvements will need to provide storm water collection for a total area of approximately 63 acres plus run-off from the new perimeter streets.

Excess topsoil excavated from the proposed project will be placed at the rear of the adjacent lots or other designated locations as directed by the Engineer. A silt fence, grass buffer strip on the right-of-way and temporary seeding will protect stockpiles. All exposed soils disturbed within 200 feet of any ditch, pond or curb and gutter system will receive temporary stabilization, or temporary/permanent seeding as soon as possible.

e. Storm Water Drainage Characteristics (From Feasibility Study)

The surface elevation of the site is generally level ranging from 905 to 910, as determined from Houston Engineering's survey data and the contouring depicted on the detention pond plans. Material excavated from the large detention pond has been placed on the HS First Addition site to add some vertical relief. The City recently constructed 12th Avenue South as a hybrid urban collector characterized by a curbed street with an open ditch along the south side of the right of way. Storm sewer manholes and underground piping exist in 34th Street and 12th Avenue.

The regional pond will reduce pollutants in stormwater runoff and maintain the peak runoff rate during the 100-year storm event. The pond, sized using the Soil Conservation Service (SCS) TR-20 method, HydroCAD and HEC-HMS, will outlet to Clay County Ditch No. 47 via a large diameter RCP storm sewer (48" to 60") which was previously installed under Project No. 03-A5-1-P2. The run-off for various events (2-yr, 10-yr, 25-yr and 100-yr) was analyzed and discharge rates were matched up with the downstream capacity in order to avoid inundation of the existing system. The City lift station at CD No. 47 is currently being upgraded to increase pumping capacity from 64 cfs to 128 cfs.

4. Potential Sources of Storm Water Contamination

The purpose of this section is to identify pollutants that could impact storm water during and after construction of this project.

a. Significant Materials Inventory

Pollutants that result from clearing, grading, excavation, road and home building materials and have the potential to be present in storm water runoff are listed in the following table. The table includes information regarding material type, chemical and physical description and specific regulated storm water pollutants associated with each material.

SIGNIFICANT MATERIALS INVENTORY				
Material/Chemical	Physical Description	Storm Water Pollutants	Location	Process for Containment
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Various colored to colorless liquids, powders, pellets or grains	Chlorinated hydrocarbons, organophosphates, carbamates and arsenic	Herbicides used for noxious weed control	Certified applicator
Permanent Seeding Fertilizer	Liquid or solid grains, nitrogen and phosphorus	Nitrogen, phosphorus, organic substrate	Permanent cover - newly seeded areas	Organic base, slow release forms only, tied up in compost
Temporary Seeding Fertilizer	Liquid or solid grains, nitrogen and phosphorus	Nitrogen, phosphorus, organic substrate	Rapid stabilization areas, topsoil berms, stockpiles	Managed application, certified installers, quick cover plant materials
Cleaning Solvents	Colorless, blue or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits	Tarps, monitor weather for rain and wind
Wastewater from construction	Equipment washing rinse water	Water soil, oil, grease and solids	Equipment washing not allowed in project limits	N/A
Asphalt	Black solid	Oil, petroleum distillates	Streets, roofing	Excess material to be removed for project limits
Concrete	White solid	Limestone, sand	Railroad tracks, culverts, curb and gutter, driveways, home foundations, masonry	Designated wash areas or complete haul removal
Glue, adhesives	White or yellow liquid	Polymers, epoxies	Expansion joints, home construction	Empty container management
Gypsum board	White solid or powder	Calcium carbonate	Home construction	Good house keeping during construction
Joint compound, wall and	White-grey paste or	Silica, calcium carbonate	Home construction	Good house keeping

ceiling texture	powder			during construction
Paints	Various colored liquids	Metal oxides, Stoddard solvent, talc calcium carbonate, arsenic	Roadway striping, home construction	Empty container management
Curing compounds	Creamy white liquid	Naphtha	Curb and gutter	Follow manufacturers recommendations
Wood preservatives	Clear amber or dark brown liquids	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	Timber pads, railroad tracks, home construction	Oil absorbing diapers, trained personnel
Hydraulic oil/fluids	Brown oily petroleum hydrocarbon	Mineral oil	Random leaks broken hoses	Oil absorbing diapers, trained personnel
Gasoline	Colorless pale brown or pink liquids	Petroleum hydrocarbon, benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment	Oil absorbing diapers, trained personnel
Diesel fuel	Clear blue-green to yellow liquids	Petroleum distillates, oil & grease, naphthalene, xylene	Secondary containment	Oil absorbing diapers, trained personnel
SIGNIFICANT MATERIALS INVENTORY CONTINUED				
Material/Chemical	Location	Storm Water Pollution	Prevention	Containment
Kerosene	Pale yellow liquid petroleum hydrocarbon	Coal oil, petroleum distillates	Secondary containment	Oil absorbing diapers, trained personnel
Anti-freeze/coolant	Clear green/yellow liquids	Ethylene glycol, propylene glycol	Random leaks and broken hoses	Trained personnel
Soil erosion	Solid particles	Soil, sediment	Project limits	Prevention and Stabilization measures within prescribed periods

b. Potential Locations for Storm Water Contamination

The following areas were identified and evaluated as potential sources of storm water contamination:

- a. Storm System Inlets
- b. Curb & Gutter
- c. Access Roads
- d. Adjacent Agricultural Land
- e. 40TH Avenue ditch
- f. Material Storage
- g. Individual Home Construction Lots
- h. Construction Soil Stock Piles

5. Storm Water Pollution Prevention Controls

The purpose of this section is to identify the types of temporary and permanent erosion and sediment controls that will be used for this project. The following controls will provide soil stabilization for disturbed areas and structural controls to prevent erosion, divert runoff and remove sediment.

a. Temporary Erosion Control

A tabulated list of stabilization procedures has been developed and locations where they are needed are shown on the project plan sheets "Storm Water Pollution Prevention Plan (Sheets 20-21)" and "Erosion Control Detail and Notes (Sheet 22)". These are part of the bid package and are attached.

This project will use silt fence and grass filter strips for perimeter control around soil stockpiles, grass buffer strips as project perimeter control, woodchip construction entrance and inlet protection. Bio-rolls and erosion control mats will be used in ditch bottoms for sediment control. Erosion control fabric will be placed around inlets that are not located in paved areas. Seeding will be used for rapid stabilization and permanent stabilization on the project.

The following soil exposure condition table* will be used during construction, including stockpiles of clay and topsoil:

Type or Condition of Slope	Areas of Inactivity – Working Days Until Area Must be Stabilized
Steeper than 3:1	7 days
10:1 to 3:1	14 days
Flatter than 10:1	21 days
Ditch within 100 ²⁰⁰ feet of “Water of the State”	Begin within 24 hours of ditch connection to “Water of the State” – stabilization must be completed within 5 working days

* This is the maximum time that an area within 200 feet of a “Water of the State” can remain exposed without a vegetative cover. The term “Waters of the State” also includes curbs, gutters, storm system inlets and temporary or permanent ditches that are directly connected to a “Water of the State”. The above as defined by MN NPDES/SDS General Storm Water Permit for Construction Activity MN R100001.

Site Control Measures and Best Management Practices:

1. Keep excavation and soil disturbing activities such as grading to a minimum.
2. Install silt fence around all clay and topsoil stockpiles.
3. Retain existing vegetation when possible.
4. Silt fences need to be cleaned, replaced or supplemented when they reach 1/3 capacity (height of fence). These actions must occur within 24 hours of discovery or as soon as field conditions allow access to the site.
5. Maintain construction entrances so that sediments are not tracked onto streets. Sweep any sediment tracked onto streets within 24 hours of discovery. This includes construction entrances to individual lots where home building is underway. Sweepers that “fling” material into the air rather picking up material will not be allowed.
6. Have materials on-site to contain and cleanup any contaminants leaked onto the ground during construction.

7. Cover or store materials (particularly fuels) so that they are not at risk to contaminate the project area during rainfall or storm water flow.
8. Water will be used for dust control on this project.
9. Good housekeeping measures are to be implemented to eliminate materials, materials packaging and other litter from leaving the project area. This is especially important during home construction.
10. Inlet protection will remain in place until 70 percent of the lots are sold and stabilized. Care will be taken to avoid disturbing protected inlets.
11. Grass filter strips will be maintained adjacent to the curb line on all undeveloped lots.
12. Care will be taken to avoid disturbing BMPs in place such as silt fence or grass filter strips along curb lines during home construction. A single rocked or gravel construction entrance will be designated and maintained into each lot under construction.
13. De-watering of trenches or basins must be done in a manner that does not cause erosion, scour or deposit sediment in curbs, gutters, storm system inlets and temporary or permanent ditches that are directly connected to a "Water of the State". The discharge must be dispersed over rock riprap, sand bags, plastic sheeting or other accepted energy dissipating measures. Use of a temporary sediment basin is preferred.
- 14. Specify and allow concrete truck washout only in designated area.**

b. Permanent Erosion Control

A permanent sediment control pond will be used to meet water quantity and quality standards. All lots will be vegetated with permanent cover as homes are sold to residents.

c. Coordination of Best Management Practices (BMPs) During Construction

Structural BMPs will be coordinated with construction activities so that BMPs are in place prior to soil disruption. The following BMPs will be coordinated with construction activity.

- i. Silt fence around the soil stock piles will be installed prior to stockpiling material with seeding of the grass filter strip completed immediately following completion of stockpiling.
- ii. Access roads will be stabilized prior to construction to prevent tracking sediment from the project area.
- iii. Inlets will be protected per specifications as they are constructed. Existing inlets will be protected prior to disruption of any soil in the project area.
- iv. All BMPs will be maintained in place until the project area is stabilized.
- v. Once grading in an area has ceased, temporary or permanent stabilization/seeding will occur per the timetable outlined above.
- vi. The pond slopes shall be covered with erosion control mats immediately following seeding.

- vii. Ditch bottoms are to be seeded followed by bio-roll and erosion control fabric within 24 hours of grading completion.

d. Certification of Compliance with Federal and State Regulations

This SWPPP reflects the requirements of NPDES for storm water management and erosion and sediment control for construction. To ensure compliance, this plan was prepared in accordance with the University of Minnesota Design Training Certification Program, MnDOT specifications used in the project plans and specifications and the Memorandum of Understanding between MnDOT and MPCA.

6. **Maintenance of BMPs and Inspection Procedures**

a. Inspections

Visual inspection of all cleared and graded areas within the project site will be performed daily. Inspections will also be performed within 24 hours after a rainfall event greater than 0.5 inches.

Formal written inspections will be performed weekly in accordance with the NPDES permit on the form provided by the Owner. The EC Supervisor or his/her documented designated storm water team members will conduct the weekly inspections. **Copies of the written weekly inspections must be submitted along with the monthly pay request. No payments will be made without submitting copies of the inspection records.**

Records of each inspection and maintenance activity shall include:

- a. Date and time of inspection.
- b. Name of person conducting inspection.
- c. Findings of inspections, including recommendations for corrective actions.
- d. Corrective actions undertaken (including dates, times and party completing maintenance activity).
- e. Date and amount of all rainfall amounts greater than 0.5 inches in 24 hours.
- f. If construction activities or design modifications are made to the site plan, which could impact storm water, this SWPPP will be amended appropriately. The amended SWPPP will have a description of the new activities that contribute to the increased pollutant loading and the planned source control measures.
- g. Where parts of the project area have undergone final stabilization, those parts may have inspections reduced to once per month. Areas not yet stabilized will still need weekly inspection.
- h. Where work has been suspended due to frozen ground the required inspections and maintenance must take place as soon as runoff occurs at the site or prior to resuming construction, which ever comes first.

- i. Erosion prevention and sedimentation control BMPs implemented on this project must be inspected to ensure integrity and effectiveness.

b. BMP Maintenance

Each respective Contractor is responsible for maintaining all BMPs during construction of underground utilities and installation of curb, gutter and paving. The appropriate Contractor is responsible for establishment and maintenance of stabilized grass filter strips adjacent to curb lines as outlined in the particular project plans & specifications and meeting the requirements of the NPDES permit.

At the end of curb, gutter and paving construction the Contractor is responsible for cleaning the pond of construction sediment to the design specifications. Once the pond has vegetative cover established on the slopes and is accepted the Owner, the City will maintain the permanent pond.

After filter strips installed adjacent to the curb lines have been established and accepted by the City, the City will complete a "Permit Transfer Modification" transferring the "Owner" designation and responsibilities to the Developer during housing construction. The City will also submit a "Notice of Termination" at that time ending the responsibility of the City and its Contractors regarding the project area. The City will retain ownership and maintenance responsibility for any sedimentation basins and storm water structures constructed as part of the project.

The responsibility for BMP maintenance of filter strips and inlet protection will be Developer's until the area meets the 70 percent cover requirement of the NPDES permit. The Developer will bury or remove accumulated concrete at the concrete truck wash out site at the end of home construction activity and restore the wash out area. The developer will be responsible for submitting a "Subdivision Registration" and terminating his responsibilities as project owner per the terms of the permit.