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Drainage Study

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1.0 CERTIFICATION STATEMENT

Responsible Corporate Officer Certification:

Per Section VI part G of the General National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10, the Responsible Corporate Officer is defined as 1) the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or 2) any person authorized to sign documents that has been assigned or delegated said authority in accordance with corporate procedures.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Date: _____
Name: _____
Title: _____
Signature: _____

Contractor Certification:

The Owner (Pleasant Ridge Wind Energy LLC) has been identified as the project contractor (Contractor); therefore additional certification is not required. However, if the Contractor should change, the SWPPP must be modified to clearly identify the contractor(s) or subcontractor(s) responsible for each activity associated with constructing this project. In addition, the contractor(s) and subcontractor(s) must sign the following certification statement before conducting any professional service at the site.

"I certify under penalty of law that I understand the terms and conditions of the General National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

Project: Pleasant Ridge Wind Energy**Permit Number: ILR** __________
Contracting Company and Address_____
Contractor's Signature_____
Date_____
Printed Name and Title_____
Telephone Number

Please make copies of this page as needed

2.0 PROJECT DESCRIPTION AND OVERVIEW

2.1 INTRODUCTION

Pleasant Ridge Wind Energy LLC (Pleasant Ridge), a wholly owned subsidiary of Invenergy Wind Development LLC (together with its subsidiaries, Invenergy), plans to construct and operate the Pleasant Ridge Wind Farm (Project). The Project is anticipated to be located in Livingston County, Illinois (refer to Figure 1) in the townships of Pleasant Ridge, Forrest, Fayette, Eppards Point, Indian Grove, Chatsworth, Charlotte, Belle Prairie and Avoca.

The following documents and related information are incorporated by reference to comprise the Pleasant Ridge Construction Storm Water Pollution and Prevention Plan (SWPPP). This plan has been developed to satisfy the National Pollutant Discharge Elimination System (NPDES) General Permit No. ILR10 for Storm Water Discharges from Construction Site Activities (General Permit). Coverage under the General Permit is required for construction activities resulting in disturbance of one acre or more of land. A copy of the General Permit is included as Appendix A. Prairie Ridge submitted a Notice of Intent (NOI) and a copy of the SWPPP to the Illinois Environmental Protection Agency (IEPA) to obtain coverage under the General Permit (refer to Appendix B). A copy of the Letter of the Notification of Coverage will be included as Appendix C and must be posted at the site in a prominent place for public viewing.

Pleasant Ridge will make the SWPPP available upon request to the IEPA or a local agency approving sediment and erosion plans, grading plans, or storm water management plans. The SWPPP and the referenced materials must be retained at the construction site from the date of Project initiation to the date of final stabilization. As needed, this SWPPP shall be amended to reflect any changes in design, construction, operation, or maintenance of the Project.

2.2 RESPONSIBLE PARTIES

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Pleasant Ridge has developed a chain of responsibility with all operators on the site to ensure that the SWPPP will be implemented and stay in effect until construction of the Project is complete, the entire site has undergone final stabilization, and a Notice of Termination (NOT) has been submitted to the IEPA. The following responsibilities have been assigned for this Project:

- SWPPP Development: Stantec on behalf of Pleasant Ridge
- Oversee SWPPP Implementation/Amendments: Pleasant Ridge
- Conduct Required Inspections: **Pleasant Ridge**
- Conduct Best Management Practices (BMPs) Maintenance and Repair: **Contractor – To be determined**

2.3 PROJECT SUMMARY

The Project will consist of up to 122 GE 1.79-100 model turbines generating approximately 218 megawatts (MW) of power. Associated facilities include graveled roads to access each turbine and above and below surface electrical cabling to collect and transmit the power to a Project substation. Pleasant Ridge anticipates that the Project could begin commercial operation as early as fall of 2015 pending completion of permitting, power off-take agreements, agency approvals, and other development activities.

Only a portion of the Project area will actually host wind power facilities. The land occupied by Project facilities will be less than one-half of one percent of the total participating Project area, assuming 136 turbines and associated access roads are constructed. The total Project area is 58,300 acres with approximately 36,400 acres of land under contract with land owners to host Project facilities. The expected area of disturbance is approximately 123 acres. Of this, approximately 123 acres will be a permanent area of direct land use for the turbines and access roads. This assumes an average of approximately 0.90 acres of land for each turbine and associated 16 foot-wide gravel access road. Approximately 10 to 20 acres of land will be required for the operations and maintenance (O&M) building and Project substation.

Construction slated for this site involves activities that shall expose soil to erosion, including, but not limited to: clearing, grading, excavation, dewatering and facility construction.

2.4 PROJECT LOCATION

The Project is located in Livingston County southeast of the town of Pontiac, Illinois and encompasses an area of approximately 58,300 acres within the townships of Pleasant Ridge, Forrest, Fayette, Eppards Point, Indian Grove, Chatsworth, Charlotte, Belle Prairie and Avoca (refer to Table 1). Approximately 36,400 acres of land are under contract with land owners to host Project facilities. The area was selected based on wind resources, land use and proximity to existing transmission infrastructure.

Table 1 – Pleasant Ridge Wind Farm Project Location

County	Total Area (Approximate Acreage)	Political Township	PLSS Township	Range	Section(s)
Livingston	58,300 (approximate acres)	Belle Prairie	25N	6E	1-2, 12
		Fayette	25N	7E	4-8
		Indian Grove	26N	6E	23-26, 35, 36
		Forrest	26N	7E	1-3, 10-15, 19-36
		Chatsworth	26N	8E	5-7, 18, 19
		Eppards Point	27N	5E	1, 2, 11-14
		Avoca	27N	6E	12-18, 22-25
		Pleasant Ridge	27N	7E	7-9, 11-36
		Charlotte	27N	8E	8-10, 16-22, 27-32

The Project is currently designed to place the turbines on agricultural lands throughout portions of the site. The preliminary locations of the turbines, access roads, power lines, communication lines interconnection point, and other ancillary facilities or structures (wind power facilities) are shown in Figure 1. The final location of wind power facilities will be determined in consultation with landowners, state and federal agencies and Livingston County. Layouts will include locations of turbines, access roads, collection lines, overhead transmission lines and property lines of adjoining property owners.

3.0 POTENTIAL FOR STORM WATER POLLUTION

3.1 LAND USE

Land use of the Project area was determined based on a review of aerial photographs and Livingston County land cover data (refer to Figure 2). The dominant land use of the Project area is farmland, consisting of **85 percent** of the Project area. Corn and soybeans are the predominant crops in the Project area. The remainder of the Project area consists of road right-of-way (ROW), non-agricultural/rural residential, farmstead sites, streams and small areas of forested upland. The landscape in the Project area is relatively flat with gently rolling hills.

3.2 SOILS

Based on the NRCS web site information, the soils for the Project location are outlined below in order of prevalence:

TABLE TO BE ADDED HERE

None of these soils are identified as hydric soils, however XX is identified as potentially hydric soil. A soils map indicating the type of soil which is typical within the Project area has been provided as Figure 3.

3.3 RECEIVING WATERS

A drainage study was conducted on the proposed Project area to determine the impact of construction on the existing drainage system (Refer to Figure 4). Using the methodology prescribed in the National Resources Conservation Service Technical Release 55 (TR-55) – Urban Hydrology for Small Watershed, the study concluded that the impacts to the existing drainage system would be well within the standard margin of error and thereby rendering the impact insignificant. The complete drainage study is provided in Appendix TBD for review.

A preliminary desktop review of existing wetland and waterway features within the Project area was completed in 2010. Wetland and waterway determinations were made by completing a desktop interpretation using Geographic Information System (GIS) technology to overlay available resources including topographic data, National Resources Conservation Service (NRCS) soil survey data, National Wetland Inventory (NWI) mapping, and recent aerial photographs. A windshield assessment was then conducted in the field to ground-truth the findings of the desktop determination.

A desktop determination was conducted within the current Project area in May 2014. The purpose of this survey was to evaluate those areas not investigated as part of the 2010 study. A windshield survey occurred in spring 2014 and a field survey in October, 2014 to ground-truth the results of the desktop determination (refer to Figure 5).

Pleasant Ridge has designed the Project facilities to avoid wetlands and waterways. Should impacts to wetlands or waterways be unavoidable as a result of construction of the Project, Pleasant Ridge will obtain the necessary permits prior to construction.

The following is a list of named receiving waters located within one mile of the Project and with the potential to receive storm water runoff from the Project site.

- Vermillion River
- South Fork Vermillion River
- North Fork Vermillion River
- Indian Creek
- Hickory Creek
- Fivemile Creek
- Felky Slough
- Unnamed tributaries of the above Creeks and Rivers

Pleasant Ridge will maintain a minimum 50-foot buffer between wetlands and the construction workspaces, where possible. The Project is not anticipated to have any permanent impact on wetlands. The Project will maintain BMPs upslope of wetland and waterbody resources.

Estimate runoff coefficient for the site after construction activities are completed.

3.4 PRECIPITATION

Average yearly rainfall, for this part of Illinois according to the U.S. Department of Commerce Technical Paper 40, ranges from XX to XX inches (refer to Appendix TBD). Individual storms during spring and summer can produce significant quantities of rainfall. For instance, a one-year/24-hour storm can produce approximately XX inches of rainfall. Storm water management will be needed to manage runoff during and after construction.

Without erosion and sediment control BMPs, the Project could produce significant amounts of sediment. The function of the SWPPP is to outline procedures to minimize erosion and mitigate sediment during construction.

4.0 CONSTRUCTION ACTIVITIES

The Contractor shall schedule and conduct all operations to minimize the exposure of soils to erosion and provide means to trap sediments leaving the site. Installation of temporary control measures that contribute to the control of erosion and prevention of sediment leaving the site shall be carried out prior to and concurrently with construction activities.

The SWPPP provides structural and non-structural activity-specific erosion and sediment control BMPs. Erosion and sediment control BMPs selected for each activity are based upon expected construction conditions and methods. The SWPPP can be modified in accordance with actual conditions encountered in the field (refer to Section 10.0).

4.1 ACCESS ROADS

Grading of access roads represents the largest land-disturbing activity of the Project. The erosion and sediment controls to be used for access road construction are dependent upon adjacent land use, overland slope, watershed area, and drainage patterns. Silt fence will be used upslope of wetlands, waterbodies, and storm water conveyances to minimize the transport of sediment laden storm water from Project-related activities. Preserved existing vegetation or compost filter socks (e.g., biorolls) can be substituted for silt fence based on site evaluation by a qualified person. Refer to Section 5.0 for the definition of a qualified person. Erosion and sediment controls for this construction include, but are not limited to: culvert protection, mulching, preservation of existing vegetation, seeding, and silt fence. Refer to Section 5.0 for additional detail on the erosion and sediment control BMPs to be used during access road construction.

4.2 WIND TURBINE FOUNDATIONS

Pleasant Ridge will utilize either a GE 1.79-100 or GE 1.79-103 turbine model with an approximate 80-meter (262.5-foot) hub height. Up to 136 turbines will be used in the Project area. All electrical turbine components shall conform to applicable local, state, and national codes and relevant national and international standards (e.g. American National Standards Institute and International Electrical Commission).

The wind turbines' freestanding tubular towers will be connected by anchor bolts to an underground concrete foundation. Geotechnical surveys and turbine tower load specifications will dictate final design parameters of the foundations. The foundation design will be engineered for the turbine type, site soils, and subsurface conditions at the turbine locations. A common foundation design is a spread footing type foundation which is typically an octagonal spread footing approximately 18 to 19 meters (59 to 62 feet) in diameter with an approximate 1-meter (3-to 4-foot) pedestal, rebar, and anchor bolts.

Construction of the turbine sites consists of stripping of topsoil and excavation for foundation slabs. Excavation will remove approximately 512 cubic yards of material per turbine site for which 332 cubic yards will be used as backfill. The Contractor is required to thin spread the surplus excavated material within the easement so as to blend with the natural contours of the land. Erosion and sediment controls for this construction include, but are not limited to: mulching, preservation of existing vegetation, seeding, and silt fence. Refer to Section 5.0 for additional detail on the erosion and sediment control BMPs to be used during the installation of wind turbines.

4.3 TRENCHING OF UNDERGROUND CABLES

A control panel inside the base of each turbine tower houses communication and electronic circuitry. Power will be run through an underground collection system at a depth of five feet or greater to the Project feeder system that will feed power to a Project 34.5/345 kV substation. Both power and communication cables will be buried in trenches on private property or public ROW at a depth below five feet. The collection system and communication cable lengths are minimized by installing underground cables the shortest distance from turbine to turbine. The cables will be installed using the open trench method; however, impacts to wetland and waterway features will be minimized by utilizing a horizontal directional drilling method. Erosion and sediment controls for this construction include, but are not limited to: mulching, preservation of existing vegetation, seeding, and silt fence. Refer to Section 5.0 for additional detail on the erosion and sediment control BMPs to be used during underground cable installation.

4.4 CONSTRUCTION OF OVERHEAD TRANSMISSION LINE

An approximate nine-mile overhead 345kV electric transmission line will be installed to connect the Project substation to the ComEd Pontiac MidPoint 345kV substation in Livingston County, Illinois. Construction of the transmission towers will involve the stripping of topsoil and excavation of additional material. Erosion and sediment controls for this construction include, but are not limited to: mulching, preservation of existing vegetation, seeding, and silt fence. Refer to Section 5.0 for additional detail on the

erosion and sediment control BMPs to be used during overhead transmission line installation.

4.5 CONSTRUCTION OF FACILITIES – OPERATION AND MAINTENANCE FACILITY

Construction of the O&M facility will involve the stripping of topsoil and excavation of additional material for the construction of foundations. Erosion and sediment controls for this construction include, but are not limited to: mulching, preservation of existing vegetation, seeding, silt fence, and a temporary sediment trap. Refer to Section 5.0 for additional detail on the erosion and sediment control BMPs to be used during construction of the O&M Facility.

4.6 CONSTRUCTION OF FACILITIES – SUBSTATION

The feeder system will deliver the power to the Project 34.5/345 kV substation. From the Project substation, an approximately nine-mile overhead 345 kV generation lead line, owned by Pleasant Ridge, will move the power to the ComEd TSS 80 Pontiac MidPoint 345 kV substation. The Project 34.5/345 kV substation will conform to industry standards and will be owned by Pleasant Ridge. The Project proposed location of the 34.5/345 kV substation and Project transmission line are shown on Figure 1.

Construction of the substation will involve the stripping of topsoil and excavation of additional material for the construction of foundations. Erosion and sediment controls for this construction include, but are not limited to: mulching, preservation of existing vegetation, seeding, silt fence and a temporary sediment trap. Refer to Section 5.0 for additional detail on the erosion and sediment control BMPs to be used during construction of the substation.

4.7 SEQUENCE OF CONSTRUCTION ACTIVITIES

All necessary sediment control measures will be in place prior to any removal or grading work and will be maintained until the potential for erosion has been eliminated. Additional information on the type and location of erosion and sediment control devices can be found in Section 5.0 and the Erosion Control Plan (refer to Figure 6). A construction sequence shall be prepared by the Contractor and included into the SWPPP; in general, construction activities will occur in the following sequence:

1. Stake the construction boundaries, sensitive areas boundaries, turbine placement, ancillary facilities, electric transmission towers, cable rights-of-way and the access roads.
2. Install stabilized construction entrances as needed to access the construction site.
3. Clear and grade turbine locations, ancillary facilities, electric transmission towers, cable rights-of-way and the access roads. Large obstacles such as trees and rocks will be removed and grading will be performed as required to provide a safe level working surface for construction activities.
4. Install necessary erosion and sediment controls in conjunction with grading activities.
5. Excavate the trench sites for cable installation, turbine locations, electric transmission towers and ancillary facilities.

6. Complete backfill and restore contours, as necessary.
7. Perform final restoration activities. Disturbed areas, except permanent aboveground facilities and access roads, will be seeded and mulched as required or restored per landowner's request.

5.0 TEMPORARY EROSION AND SEDIMENT CONTROL BMPs

As outlined in the General Permit Part IV.D.2a, erosion and sediment controls must be designed, installed and maintained to minimize the discharge of pollutants. The Illinois Urban Manual (IUM) or other similar documents shall be used for developing the appropriate management practices, controls, or revisions of the SWPPP. A copy of the IUM's Practice Standards, Construction and Material Specifications applicable to the Project are described in Sections 5.0 and 6.0 and are included in Appendix D.

A sequence for installation of erosion and sediment control BMPs, stabilization activities, and maintenance shall be prepared by the Contractor and included into the SWPPP.

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General principles in developing the sequence of activities include, but are not limited to, the following:

- Install downslope and side-slope perimeter controls before land disturbing activity occurs.
- Do not disturb an area until it is necessary for construction to proceed.
- Cover or stabilize disturbed areas as soon as possible.
- Time construction activities to limit impact from seasonal climate changes or weather events.
- Do not remove temporary perimeter controls until all upstream areas reach final stabilization.

Temporary controls for construction activities include the following:

- Control of ground and surface water
- Culvert protection
- Ditch protection
- Erosion Control Blanket
- Mulch
- Temporary seeding
- Preserve existing vegetation
- Silt fence
- Slope protection
- Temporary stream crossing
- Street cleaning
- Temporary construction entrances/exits
- Temporary sediment trap
- Topsoil segregation and stockpile protection area

The structural BMPs shall be installed as recommended on the Erosion Control Plan (refer to Figure 6) and as specified in Appendix D. A qualified person knowledgeable in the principles and practice of erosion and sediment control, such as a licensed engineer or other knowledgeable person who possess the skills to assess conditions at the construction site that impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activities will conduct regular inspections of the Project site. A qualified person on-site can modify recommendations for the field as he or she deems necessary.

Per Part IV.D.2b of the General Permit, temporary or permanent stabilization of disturbed areas must be initiated immediately, but no later than one working day, whenever any clearing, grading, excavating or other earth disturbing activities have temporarily or permanently ceased on any portion of the Project site and will not resume for 14 calendar days or more. Stabilization must be completed as soon as possible but not later than 14 days from the initiation of stabilization work in an area. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

5.1 CONTROL OF GROUND AND SURFACE WATER

During trenching operation and other construction related activities, dewatering may be required. All dewatering activities will be conducted under the conditions of the General Permit (refer to Appendix A) and per IUM Practice Standard Code 813 (refer to Section 4.0 of Appendix D). If dewatering is required, BMPs will be used to filter sediment from the discharged water. If required, the Contractor shall construct a sediment trap to settle out sediment before the discharged water enters surface waters. The Contractor shall not discharge sediment-laden water directly into a surface water or conveyance (e.g., drainage pipe, road ditch, etc.).

Control of surface water may be necessary during the Project. Surface water may need to be diverted around or through the construction by earthen berms or trenches. Refer to IUM Construction Specification 760 – Temporary Stream Diversion (Section 5.0 of Appendix D). Water collected in excavation areas throughout the Project site may be removed using pumps. Discharge from dewatering operations must be treated in a sediment trap or equivalent BMP.

5.2 CULVERT PROTECTION

Storm water culverts and inlets will be protected from construction site runoff using silt fence, rock riprap, or other sediment barriers. Refer to IUM Practice Standard Codes 808 and 910 (refer to Section 4.0 of Appendix D). Additional information is also provided in Section 6.1, Riprap.

5.3 DITCH PROTECTION

At a minimum, the last 200 feet of a ditch shall have temporary or permanent stabilization measures in place within 24 hours of direct connection to a surface water. Ditches shall be kept in a rough, graded but smooth condition in order to properly install erosion control seeding, mulch, mats, and blankets. Stabilization methods for ditch bottom wetted perimeters will include one of the following, or combinations of, erosion control blankets, mats, riprap, biorolls, or rock check dams. The method chosen will be based on an analysis of the tractive forces on the lining. Ditch grades between 3 and 5 percent will require rock checks or category four erosion control blanket and biorolls, to be determined based on flow velocities. Where ditch grades exceed 5 percent, type seven rock check dams, or equivalent bmp, shall be installed. Check dams will be spaced so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. Above the wetted perimeter, the ditch will be stabilized by seeding and mulch and/or erosion control blankets, depending on side slope steepness and length. Refer to IUM Practice Standard Codes 805, 814, 875 and 965 (Section 4.0 of Appendix D).

5.4 EROSION CONTROL BLANKET

Temporary disturbance to stream banks and road ditch banks are anticipated as a result of construction activities. Erosion control blankets will be installed on exposed slopes that are 2:1 or flatter and newly seeded areas, as appropriate. Where necessary, erosion control blankets will be installed along stream banks and road ditch banks within 24 hours of the completion of construction activities. Non-channel erosion mats will be installed as appropriate along disturbed areas to prevent the release of sediment from

the Project area following construction activities. Refer to IUM Practice Standard Code 830 (refer to Section 4.0 of Appendix D).

5.5 MULCH

Mulch may be used to stabilize disturbed areas. Mulch cannot be placed in wetlands or on actively cultivated land. Mulch materials shall be spread uniformly by hand or machine. Straw mulch material shall be stabilized within 24 hours of application using a mulch crimper or equivalent anchoring tool or by a suitable tackifier. Hand methods shall be used where equipment cannot safely operate to perform the work required. Hand methods shall be used where equipment cannot safely operate to perform the work required. **When spreading straw mulch by hand, divide the area to be mulched into approximately 1,000 sq. ft. sections and place approximately 90 lbs. of straw in each section to facilitate uniform distribution.**

Straw mulch shall be anchored immediately after spreading to prevent wind blow. One of the following methods of anchoring straw shall be used:

- a. Mulch Anchoring Tool - This is a tractor-drawn implement (mulch crimper, serrated straight disk, or dull farm disk) designed to punch mulch approximately 2 – 3 inches into the soil surface. This method provides maximum erosion control with straw. It is limited to use on slopes no steeper than 3:1, where equipment can operate safely. Machinery shall be operated on the contour.
- b. Liquid Mulch Binders - Application of liquid mulch binders and tackifiers should be heaviest at edges of areas and at crests of ridges and banks, to prevent wind blow. The remainder of the area should have binder applied uniformly. Binders (asphalt, synthetic/chemical or wood fiber) may be applied after mulch is spread; however, it is recommended that it is sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is the most effective method.
- c. Mulch Nettings - Lightweight, degradable, plastic, polyester, or paper nets may be stapled over the mulch according to manufacturer's recommendations. When mulching is done in late fall or during June, July, and August, or where soil is highly erodible, nets should only be used in conjunction with an organic mulch such as straw

5.6 TEMPORARY SEEDING

When disturbed soils are left exposed or permanent turf establishment is not possible due to seasonal restrictions in pasture, ditch bottoms, side slopes and fill slopes, then apply the appropriate temporary seed mix for the time of year and apply straw mulch. As per the requirements taken from the IUM, all exposed areas with a continuous positive slope within 200 linear feet of surface water must have temporary erosion protection or permanent cover for exposed soil areas year round.

Unless otherwise specified, seeding shall be accomplished within two days after final grading is completed (per IUM Construction Specification 6; Section 5 of Appendix D).

The Contractor shall apply temporary seed mixtures outlined in Table 2 as deemed appropriate for the seeding dates and construction activities.

Table 2: Temporary Seed Mixtures

Seeding Dates	Species	Application Rate
Early Spring – July 1	Oats	90 lbs/acre
Early Spring – September 30	Cereal Rye	90 lbs/acre
Early Spring – September 30	Wheat	90 lbs/acre
Early Spring – September 30	Perennial Ryegrass	25 lbs/acre

Seed shall be evenly applied with a cyclone seeder, drill, culti-packer seeder, or hydroseeder. Small grains shall be planted no more than one inch deep. Grasses shall be planted no more than one-half inch deep. Cover broadcast seeds by culti-packing, dragging a harrow, or raking. Refer to IUM Practice Standard Codes 880 and 965 for additional details (Section 4.0 of Appendix D).

5.6.1 Seed Bed Preparation

Prepare seedbed of loose soil to a depth of 3 to 4 inches. If recent tillage or grading operations have resulted in a loose surface, additional tillage or roughening may not be required except to breakup large clods. If rainfall caused the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. Groove or furrow slopes steeper than 3:1 on the contour before seeding.

Where the pH of the soil is below 5.5, apply 1.5 to 2 tons per acre of finely ground agricultural limestone. If the seeding period is less than 30 days, liming will not be required. Apply 500 pounds per acre of 10-10-10 fertilizer or equivalent. Incorporate lime and fertilizer into the top two to four inches of soil. If the seeding period is less than 30 days, fertilizer will not be required.

5.7 PRESERVE EXISTING VEGETATION

The Contractor shall preserve existing natural vegetation. Natural vegetation provides a buffer zone and stabilized area which helps control erosion, protect water quality, and enhance aesthetic benefits. This also minimizes the amount of exposed bare soil.

5.8 SILT FENCE

Silt fence shall be installed around staging areas and stockpiles/waste area, to protect trees from damage, and on the contour to capture overland, low-velocity sheet flows down gradient of all exposed soils and prior to discharging to surface waters. Silt fence shall be either machine sliced into the soil or installed by hand. Hand-installed silt fence shall have the edge buried or weighted by sand bags. Refer to IUM Practice Standard Code 920 (Section 4.0 of Appendix D).

5.9 SLOPE PROTECTION

There will be no unbroken slope lengths greater than 75 feet for slopes with a grade of 3:1 or steeper. All exposed areas with a continuous positive slope within 200 feet of

surface water will have a temporary or permanent cover year round. Planned slopes of 3:1 or steeper and greater than 75 feet in length will be temporarily or permanently stabilized in increments not to exceed 75 feet, prior to constructing or disturbing a new increment. Long slopes shall be broken into shorter lengths by installing silt fence in J-hooks along the contour or by installing biorolls in interlocking herringbones. If temporary seeding and mulch cannot be used on slopes steeper than 3:1, then the slope shall be covered with tarps or plastic sheeting. The solo surface on revegetated slopes will be roughened using any appropriate implement that can be safely operated on the slope, such as bulldozers or disks. The grooves will be created perpendicular to the slope to help establish vegetative cover, reduce runoff velocity, increase infiltration, and provide for sediment trapping. Staged seeding and mulching of slopes shall be done as fill is raised and the lower slope becomes inactive.

5.10 TEMPORARY STREAM CROSSING

A bridge, ford, or temporary structure may be installed across a stream or watercourse for short-term use by construction vehicles or heavy equipment. Generally, a temporary stream crossing is applicable to streams with drainage areas less than one square mile; bridge designs to cross streams with larger drainage areas should be completed by a qualified engineer. At a minimum, the crossing structure must be designed to allow passage of bank full flow or peak flow from a 2-year frequency, 24-hour duration storm. Installing a structure to span the waterbody banks will facilitate passage of construction equipment without moving sediment into streams, damaging the streambed or channel, or causing flooding. Refer to IUM Practice Standard Code 975 located in Section 4.0 of Appendix D.

5.11 STREET CLEANING

Cleaning tracked sediments and debris from paved streets, as needed, prevents unwanted material from being washed into surface waters, and improves the appearance of public roadways. The Contractor shall inspect paved roadways in front of construction entrances/exits at the end of each day and tracked soil shall be removed.

5.12 TEMPORARY CONSTRUCTION ENTRANCES/EXITS

Stabilized temporary construction entrances will be installed, as appropriate, for portions of this Project where existing roadways do not exist. In areas where existing roadways are in close proximity to the construction site, construction entrances may not be required. To prevent tracking sediments onto paved surfaces, construction entrances shall be constructed by overlaying geotextile fabric with a six-inch bed of class 5 gravel. Vegetation and topsoil shall not be removed from the shoulder zones to construct the entrances, but tall vegetation may be mowed. Refer to IUM Practice Standard Code 930 located in Section 4.0 of Appendix D.

If entrance begins to rut, stabilize by placing a geogrid and additional class 5 gravel in roadway. The entrances radius shall be reduced and the area restored to the geometry of a rural county road intersection at the end of the Project. Areas outside of the permanent roadway shoulder may require re-grading. Compacted soils shall be

loosened by ripping or disking, then re-vegetated and mulched. This should be completed in conjunction with the other Project activities proposed for this site.

5.13 TEMPORARY SEDIMENT TRAP

A small, temporary ponding basin may be constructed to detain sediment-laden runoff from disturbed areas of five acres or less. In addition, sediment-laden discharge from dewatering operations may be directed to a temporary sediment trap. The sediment trap volume must be at least 134 cubic yards per acre of the contributing area. The Contractor shall consider the use of silt fence or hale bales to trap sediment if space is not available within the property boundaries. Refer to IUM Practice Standard Code 960 located in Section 4.0 of Appendix D.

5.14 TOPSOIL SEGREGATION AND STOCKPILE PROTECTION AREA

The Contractor shall explore the project area to determine if sufficient surface soil of good quality exists to justify stripping. Stripping of topsoil from areas where it will later be reapplied is not recommended if bedrock or other root limiting layer is present within a depth of 20 inches.

Topsoil shall be free of debris, trash, stumps, rocks, and noxious weeds, and shall give evidence of being able to support healthy vegetation. It shall contain no substance that is potentially toxic to plant growth. Topsoil shall be spread at a lightly compacted depth of two to four inches; depths of four inches or greater are recommended where fine-textured (clayey) subsoil or other root limiting factors are present. Refer to IUM Practice Standard Code 981 located in Section 4.0 of Appendix D.

It is envisioned that some of the excavated materials shall be suitable for backfill and site restoration. Topsoils and organic soils stripped prior to excavation shall be stockpiled separately from materials suitable for backfill or access road embankment. Unsuitable material shall be promptly removed from the site or stockpiled until removal is possible. Silt fence shall be installed around the entire perimeter of segregated topsoil areas and waste area stockpile location to prevent sediment from leaving the designation location. These areas shall be determined by the Contractor and protected as defined herein.

Soil stockpiles shall be stabilized or protected with sediment trapping measures such as practice standards silt fence or temporary seeding. Perimeter controls shall be placed around the stockpile immediately; seeding of stockpiles shall be completed within 7 days of formation of the stockpile if it is to remain dormant for longer than 30 days.

6.0 PERMANENT EROSION AND SEDIMENT CONTROL BMPs

Permanent erosion control reestablishes vegetative cover with native or adapted species appropriate to the geographic region and includes any structural modifications needed to ensure long term sustainability. Permanent BMPs include: cleaning out sediment from channels, a sedimentation basin, and ditches; flushing outlet pipes clean; removing any unneeded temporary BMPs within the construction area that may interfere with permanent BMPs, except perimeter silt fences and as directed by a qualified person.

Permanent controls for construction activities may include:

- Riprap
- Turf establishment

Per Part IV.D.2b of the General Permit, temporary or permanent stabilization of disturbed areas must be initiated immediately, but no later than one working day, whenever any clearing, grading, excavating or other earth disturbing activities have temporarily or permanently ceased on any portion of the Project site and will not resume for 14 calendar days or more. Stabilization must be completed as soon as possible but not later than 14 days from the initiation of stabilization work in an area. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

6.1 RIPRAP

Riprap shall be placed at culvert outlets, if necessary, per local requirements and in accordance with IUM Practice Standard Codes 808 and 910 (refer to Section 4.0 of Appendix D).

6.2 TURF ESTABLISHMENT

When land disturbing activities are completed permanent, turf establishment shall then be completed. Permanent seeding, as noted in the IUM Code 880a Table A – *Grass, Forb and Sedge Species for Low Maintenance Areas* (refer to Section 4.0 of Appendix D), includes oats and perennial ryegrass at seeding rates of 30 to 50 lbs/acre and 10 to 30 lbs/acre, respectively, based upon Pure Live Seed. These are the most practical options for permanent vegetation as they have also been identified for temporary cover.

All seeds shall have the proper stratification and/or scarification to break seed dormancy for spring or early summer plantings. No treatments are needed for late summer, early fall, or dormant seeding.

6.2.1 Seeding

Seeding may be done by any of the following methods:

1. Conventional Drill

- a. Apply seed uniformly at a depth of 0.25- to 0.5-inch with a drill (band seed) or cultipacker seeder. On sloping land, seeding operations should be on the contour wherever possible.
- b. Apply mulch or erosion blanket following seeding as required.

2. Broadcast Seeding

- a. Culti-pack or roll seedbed, then apply seed uniformly and cover to a 0.25- to 0.5-inch depth with a cultipacker, or similar tool. Spinning disc type

broadcasters equipped with an agitator are effective with native seed mixes. Often broadcasters require the use of a carrying agent such as oats or vermiculite. Attention should be given to seed mixes with seeds of varying size and weight so that the seed remains effectively mixed during seeding operations.

- b. On sloping land, dragging, harrowing, or culti-packing should be done on the contour to ensure seed-soil contact and reduce erosion.
- c. Apply mulch or erosion blanket following seeding as required.

3. Hydroseeding

- a. For areas to be hydroseeded, final seedbed preparation shall leave the soil surface in a slightly roughened condition.
- b. Lime and fertilizer shall be incorporated prior to seeding unless they are to be applied at the same time as the seed (applying lime with a hydroseeder may be abrasive to the equipment). Do not use hydrated lime in a slurry mix.
- c. A minimum of 1,000 gallons of water/acre shall be used. The hydraulic seeding equipment shall include a pump rated and operated at no less than 100 gallons/ minute and at no less than 100 pounds/sq. in. pressure. The tank shall have a mechanical agitator powerful enough to keep all materials in a uniform suspension in the water. Calibration of the hydraulic equipment shall be accurate.
- d. If seed and fertilizer are mixed together they should be seeded within two hours of mixing.

4. Dormant Seeding

Dormant seeding may be done between November 15 and March 15 by using conventional drill or broadcast methods. If soil conditions are suitable during the dormant seeding period, prepare the seedbed and seed as indicated in this specification. Apply mulch or erosion blanket following seeding.

5. No-till

In some instances it may be desirable to sow seed into existing sod, a temporary cover crop, or natural vegetation. Drilling may be done after herbicide application to non-native sod or undesirable weeds such as Canada thistle. A rangeland type grass drill with a no-fill attachment shall be used. Seeds should be drilled to the depth appropriate for the species, according to the supplier's recommendations.

The seeds of some plants require light-to-stimulate germination and growth. In situations with some of these species, particularly some native forbs, a combination of broadcasting and no-till drilling may be used. Grasses should be drilled first, followed by broadcasting of the desired forbs.

6.2.2 Seedbed Preparation

Prior to seeding or planting, the seedbed shall be relatively free of all weeds (greater than 80 percent weed free), stones, roots, sticks, rivulets, gullies, crusting, and caking, or other debris which may interfere with seeding or planting operations or plant establishment. The seedbed shall not be worked when frozen or saturated. Prior to seeding or planting the surface shall be disked or raked to a depth of two to three inches either by hand or mechanical means to create a smooth, uniform seedbed.

If needed, based upon soil conditions and desired vegetation type, incorporate the lime and fertilizer into the soil with a disk harrow, spring tooth harrow, or similar tool, to a depth of at least three inches. On sloping areas, the final operation shall be on the contour.

Fertilizer or lime is generally not recommended for native vegetation establishment unless soil tests indicate a pH less than 5.5, Phosphorus less than 15 lbs/acre or Potassium less than 150 lbs/acre. If levels are below this, apply lime and fertilizer according to a soil test and the needs of the vegetation selected. In areas that have not been regraded, which have grown up in weeds, or to be no-till seeded, an herbicide application may be necessary to reduce competition with the desired vegetation. An approved herbicide may be used to treat such areas to kill all existing vegetation. Herbicide application shall be done at least 15 days prior to seeding or planting.

6.2.3 Mulching/Erosion Blanket

All permanent seeding application shall be mulched upon completion of seed application or planting. Erosion blanket should be substituted for mulch on steep slopes (10 percent slope or greater) or wherever highly erosive conditions exist (e.g. in drainage swales or waterbody shorelines). When planting ground covers, it may be advantageous to apply mulch or erosion blanket prior to planting. Plants should then be tucked into the soil through slits or holes. In all cases, planting should be done in a staggered pattern to minimize erosion.

6.2.4 Maintenance

The Contractor shall inspect all planted areas for failures and make necessary repairs, replacements, reseeding, and re-mulching within the planting season, if possible. If a stand has less than 70 percent ground cover, reevaluate the choice of plant materials, quantities of lime and fertilizer, seeding or planting methods, time of seeding or planting, and available light and moisture. Reestablish the stand with modifications based on the evaluation.

7.0 PERMANENT STORM WATER MANAGEMENT

Infiltration or other volume reduction practices are/are not required for the Project based on X.

8.0 POLLUTION PREVENTION

8.1 SPILLS

Spills (e.g., petroleum) will be contained and cleaned up promptly by placing contaminated soils in a drum(s) for proper disposal off-site. Fluids will be disposed of in compliance with the requirements of applicable laws and regulations, including Illinois Administrative Code Title 35, Parts 700-739. Refer to IUM Construction Specification 5 – Pollution Control in Section 5.0 of Appendix D. A copy of Pleasant Ridge's standard Spill Prevention, Containment, and Countermeasure (SPCC) Plan is included in Appendix E.

8.2 TRASH AND DEBRIS

Trash and debris will be collected and the Contractor shall keep the work site clean. All solid waste generated from the Project site will be properly disposed of according to federal, state and local requirements. No on-site burning is permitted and no trash and debris will be buried within fill or backfill.

8.3 HAZARDOUS MATERIALS

Oils, fuels, and any hazardous substances must be properly stored, including secondary containment for tanks larger than 55 gallons, to prevent spills. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of hazardous materials must be in compliance with federal, state, and local regulations. Spill kits or other suitable emergency action procedures to handle small chemical, petroleum, hazardous, or other non-storm water material which has the potential to contaminate groundwater or surface waters must be properly contained and mitigated by the Contractor.

8.4 TRUCKWASHING

If required, a location shall be set aside for washing concrete trucks. Discharge from the wash shall be directed into a sediment trap, which shall also receive waste concrete. The trap shall be cleaned out once the washout is two-thirds full and the material disposed of off-site. Refer to IUM Practice Standard Codes 954 and 960 (Section 4.0 of Appendix D).

8.5 DUST CONTROL

The Contractor shall take measures to prevent fugitive dust during the work. This may require periodic wetting of exposed soils and engineered fills until soils are stabilized and pavement is installed. Refer to IUM Practice Standard Code 825 (Section 4.0 of Appendix D).

9.0 INSPECTION AND MAINTENANCE

9.1 INSPECTION

Periodic inspections should be conducted of temporary and permanent erosion and sediment controls by a qualified person at least once every seven calendar days, within

24 hours of rainfall events that produce more than 0.5 inches of rain in a 24-hour period or greater, or an equivalent snowmelt event. Records shall be kept for each inspection and maintenance activity and shall contain the following information:

- Date and time of inspection;
- Name of person(s) conducting inspection;
- Findings of inspections, including recommendations for corrective action;
- Corrective actions taken, including dates, time, and party completing maintenance activities;
- Date and amount of all precipitation events that produce more than 0.5 inches of rain or equivalent snowmelt in a 24-hour period or greater; and
- Document changes to SWPPP

An example Inspection Log is provided in Appendix F.

If modifications to the SWPPP or corrective actions are required as noted by a qualified person after site inspections, the repairs and modifications must be implemented within seven calendar days following the inspection. If the site is in violation of the SWPPP, the appropriate Agency Field Operations Section office must be notified via email within 24 hours of the observed incident or noncompliance (epa.swnoncomp@illinois.gov). In addition, an Incident of Noncompliance report must be completed and submitted within five calendar days to IEPA (refer to Appendix G):

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

9.2 MAINTENANCE

It is the Contractor's responsibility to maintain silt fences and other temporary erosion and sediment controls in working order throughout the Project and make repairs as needed until the site achieves final stabilization and a NOT has been submitted to the IEPA.

Maintenance shall include the following:

- Sediment trap shall be at 50 percent capacity.
- Excess sediment behind silt fences and biorolls shall be removed and properly disposed when sediments reach one-third the height of the structure.

10.0 UPDATING AND MODIFYING THE SWPPP

Pleasant Ridge will amend the SWPPP as necessary to correct problems identified or address situations whenever:

1. There is a change in design, construction, operation, or maintenance that has a significant effect on the potential for the discharge of pollutants to surface waters or underground waters.
2. Inspections or investigations by site operators, local, state or federal officials indicate the SWPPP is not effective in eliminating or significantly minimizing the discharge of pollutants to surface waters or underground waters or that the discharges are causing water quality standard exceedances.
3. The SWPPP is not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity, or the SWPPP is not consistent with the terms and conditions of this permit.
4. If any new contractor and/or subcontractor is identified that will implement a measure of the SWPPP. New contractors and/or subcontractors are required to sign the certification statement provided in Section 1.0 of the SWPPP.

11.0 NOTICE OF TERMINATION

The Owner is required to submit a NOT to the IEPA after one or more of the following conditions have been met:

1. Final stabilization has been achieved on all portions of the site for which the Owner is responsible; or
2. All storm water discharge from construction activities authorized by this permit is eliminated.

A copy of the NOT is provided in Appendix H.

The General Permit defines final stabilization as when either of the following conditions on disturbed areas:

- 1) A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
- 2) Equivalent permanent stabilization measures (e.g., riprap, gabions, or geotextiles) have been employed.

12.0 RECORD RETENTION

A copy of the SWPPP will be kept on-site for the entire duration of the Project. The materials included in the SWPPP will include documentation of any changes, NOI, permit coverage letter, inspection and maintenance records, permanent operation and maintenance agreements, and calculations for design of both temporary and permanent storm water management systems. As required by the General Permit, copies of the SWPPP and all inspection reports will be forwarded to Pleasant Ridge and kept on file for a period of at least three years from the date the permit is terminated.