PART V

RECLAMATION PLAN

1) Provide a reclamation plan outlining proposed reclamation of the lands within the proposed permit area. The reclamation plan shall include the following:

1) A) Provide for each major step in the proposed reclamation plan a detailed timetable for completion.

When mining is completed, final reclamation of the mine site will begin. The area will be reclaimed in accordance with the timeframes and limits established in the permanent program rules and regulations that exist at that time. If variances or grading time extensions become necessary, the permittee will submit timely grading time requests to the Department for their approval.

Following recovery of the useable underground mining equipment, the mine entry slope and shafts will be backfilled and sealed in accordance with all applicable rules and regulations. Surface facilities and structures not required to support the approved post-mining land use will be removed. Salvageable structures and materials will be sold if economically possible. Obsolete structures and materials will be removed from the mine site and deposited in an approved landfill. Affected areas will be graded to conform to the approved reclamation plan.

Soil replacement and establishing vegetation are dependent on seasonal weather conditions. To obtain optimum efficiency and avoid undesirable compaction, soil replacement will be accomplished during the dryer summer. Soil materials required for final reclamation will be obtained from stockpiled soil that was removed from the site prior to disturbing the area by mining activity. It is anticipated that sufficient soil material will be stockpiled so that additional borrow areas will not be necessary to complete final reclamation. However, the permittee will solicit Department approval should it become apparent at a later time that borrow areas are necessary to complete required reclamation. Reclaimed areas will be seeded during the first normal planting period following soil replacement. Soil will be replaced, and vegetation established in accordance with the approved post-mining land uses.

Surface water and groundwater monitoring will continue at the site as required until approval is obtained from the proper regulatory agencies to discontinue monitoring.

1) B) Provide a detailed estimate of the cost of reclamation for the proposed surface mining operation required to be covered by a performance bond. Provide calculations and/or drawings, cross sections, maps, etc. to support the reclamation cost estimate.

See *Attachment V-1B* for a detailed reclamation cost estimate.

Provide extra calculations for multiple portals or refuse areas.

The estimate of the cost of reclamation should be based on the following:

1) B) 1) REFUSE

1) B) 1) a)	Gob Pile(s)	**1**
	Pile ID	**Refuse Impoundment**

Initial Height	**30'**
Final Height	**75'**
Average Bottom Diameter	**1650' X 2220'**
Lime Application (Tons/Ac)	**Lime quantities will be determined by toxicity testing that will be performed after the Refuse Impoundment is constructed.**
Cover Thickness	**4'**
Method of Replacement	**Tractors w/wheeled pans**
Average Haul Distance	**1,500'**

1) B) 1) b) Gob and Slurry Disposal

*Below grade or in levees	**N/A**
Disposal Area ID	
Cover Thickness	
Method of Replacement	
Average Haul Distance	
Lime Application (Tons/Ac)	

1) B) 2) SUPPORT AREAS (Use separate sheets for each portals) Support Structure Dimensions

The response to questions 1)B)2)a) through c) is indicated in the following table. The table lists all the proposed building structures proposed to be constructed on-site. The building/structure locations are illustrated on the *Surface Drainage Map, Map D*.

Structure	Construction Material	Structure Dimensions (W' x L' x H')	Concrete Floor Dimensions (W x L x T)
Washplant	**Pre-Eng. Metal**	**60' X 80'X 90'**	**60' X 80 'X 12"**
Office/Showerhouse	**Pre-Eng. Metal**	**80' X 180' X 30'**	**60 'X 130 'X 4"**
Shop	**Pre-Eng. Metal**	**60' X 130' X 30**	**60' X 180' X 8"**
Warehouse	**Pre-Eng. Metal**	**60' X 130' X 30**	**60' X 180' X 8"**
VFD Building	**Pre-Eng. Metal**	**20' X 30' X 12'**	**20' X 30' X 4"**
Transfer Building	**Pre-Eng. Metal**	**20' X 20' X 12'**	**20' X 20' X 4"**
North Stacker	**Metal Truss**	**180' Radius X 80' H**	
South Stacker	**Metal Truss**	**180' Radius X 80' H**	
Thickner	**Concrete**	**10'H X 90'Dia X 12"Wall**	
Truck Scale	**Concrete**	**(2) 12' X 20' X 1.5'**	

In addition to the buildings and structures listed in the previous table, the following structures and boreholes will be constructed on site:

Air Shafts: Intake – 16' Diameter X 365' Deep
Return – 16' Diameter X 365' Deep

Man & Material Slopes: 2380'L X 15'W X 10.5'H

Boreholes:
Monitoring Well 1 – 2" Dia. X 29' Deep
Monitoring Well 2 – 2' Dia. X 32' Deep
Monitoring Well 3 – 2" Dia. X 38' Deep

Monitoring Well 4 – 2" Dia. X 35' Deep
Monitoring Well 5 – 2" Dia. X 45' Deep
Monitoring Well 6 – 2" Dia. X 54' Deep

1) B) 2) a) Structure	Structure ID	Height Ft.	Width Ft.	Length Ft.
See table above				

1) B) 2) b) Concrete Structures	Structure ID	Height Ft.	Width Ft.	Length Ft.
See table above				

1) B) 2) c) Silos	Structure ID	Height Ft.	Width Ft.	Length Ft.
N/A				

1) B) 2) e) Conveyors	Length
Conveyors (Total)	**3000'**

1) B) 3) Railroads to be Removed — Length

N/A

1) B) 4) Haulroads to be Removed	Width	Length
Haul Road #1	**20'**	**3,104'**
Haul Road #2	**20'**	**5,443'**
Haul Road #3	**20'**	**4,779'**
Haul Road #4	**20'**	**1,930'**

1) B) 5) Support Area Liming (Acres)

	Non-Refuse (for areas required to have more than topsoil replaced)
Lime Appl. (Tons/Ac)	_____
Subsoil Cover Thickness	_____
Method of Replacement	_____
Average Haul Distance	_____

It is not anticipated that lime application will be necessary to achieve post-mining vegetation/productivity.

1) B) 6) Indicate location and size of buried volatile material storage facilities.

This permit does not propose any buried volatile material storage sites.

1) C) Backfilling and Grading

Provide a plan for backfilling, soil stabilization, compacting and grading, with contour map or cross-sections showing the anticipated final surface configuration of the proposed permit area (in accordance with 62 Ill. Adm. Code 1817.102 through 1817.107). The plan shall include the following:

1) C) 1) Describe how approximate original contour will be achieved. Discuss method(s) to be employed for overburden removal, spoil placement, and grading, including the removal and redistribution of soil. Mention type of equipment to be used for each phase of work.

Backfilling, grading and soil replacement will be accomplished with dump trucks, dozers, tractors with wheeled pans and road graders. Disturbed areas, except for the Refuse Impoundment, will be restored to approximate original contour. This will be accomplished by blending the disturbed areas with the natural ground surface of the undisturbed areas during the grading process then replacing topsoil on the disturbed areas.

The out slopes of the Refuse Impoundment will not exceed 3H:1V. After all coarse refuse waste material generated by coal processing has been disposed of, toxicity testing will be performed to determine the net neutralization potential of the waste material. Lime, if determined to be necessary, will be incorporated into the surface of the refuse before covering it with 4 feet of non-toxic, non-combustible soil materials

1) C) 2) Provide sufficient contour maps and cross-sections to show the anticipated final surface configuration of the proposed permit area when reclamation work is completed.

Except for the reclaimed Refuse Impoundment, the post-mining topography will closely resemble the pre-mining topography of the area as indicated on available USGS topographic mapping.

The Refuse Impoundment will be approximately 75 feet high with 3H:1V out slopes.

1) C) 3) The areas other than those reclaimed to the standards of high capability lands and prime farmlands, describe all water and erosion control structures to be constructed such as terraces, diversions, etc.

Please refer to the report written by Patriot Engineering and Environmental for information on all water and erosion control structures to be constructed on the Refuse Impoundment. The report is included herein as *Attachment IV-6B*.

1) C) 4) Describe the timing in which all grading and the construction and removal or renovation of water and erosion control structures will be complete and the sequence for accomplishing the work in relation to seasonal weather conditions.

Removal of water and erosion control structures will be done under favorable weather conditions and in accordance with Section 1817.41 of the regulations.

1) C) 5) Are any roads constructed to facilitate surface coal mining operations proposed to be permanent?
Yes _____ No **X**

If yes, locate on the reclamation map. Provide the information required for Part IV 5)C)2) to describe each post-mining road if it is to be modified. Include appropriate discussion how modifications will be accomplished including the removal and disposition of any excess road material.

1) D) Provide a plan for revegetation of the proposed permit area including but not limited to the following:

1) D) 1) Provide a schedule of revegetation for each reclamation area or sub area within the permit area.

All areas will be seeded during the first favorable planting season following final grading except where it is determined appropriate to use a dormant seeding. If it is later determined that the dormant seeding was not successful, the area will be reseeded during the following established optimum planting period.

1) D) 2) a) For areas other than forest and/or wildlife habitat planting, list the species and seeding rates on a per acre basis for each species proposed to be utilized.

All areas will be seeded during the first favorable planting season following final grading except where it is determined appropriate to use a dormant seeding. If it is later determined that the dormant seeding was not successful, the area will be reseeded during the following established optimum planting period.

The applicant is aware that not all the species listed in the following Standard Seed Mixtures table are native to Illinois. However, the non-native species listed can be found in nearly every county in Illinois(1). Additionally, the species listed have been used successfully for several decades to provide excellent wildlife habitat on reclaimed mine sites in Illinois.

For instance, Korean Lespedeza attracts many insects. The height and structure of the plants make those insects available to bobwhite chicks. Korean Lespedeza also provides an excellent food source to Cottontail Rabbits from June through October, and a protective cover to rabbits during the winter months.

Red Clover, Alsike Clover, and Orchard Grass are common plants that are known to occur in every county in Illinois(1).

The nectar and pollen of the Red Clover flowers attract many kinds of long-tongued bees, including bumblebees, Anthophorine bees, Mason bees, and large Leaf-Cutting bees. Butterflies, skippers, and day-flying Sphinx moths also visit the flowers for nectar. Typical visitors among the butterflies include Swallowtails, Monarchs, Painted Ladies, Whites and Sulfurs. The caterpillars of several butterflies feed on the foliage, including Eastern Tailed-Blue, Orange Sulfur, Clouded Sulfur, and Dog-Faced Sulfur. The caterpillars of many moth species also feed on the foliage. Both the seedheads and foliage are eaten occasionally by upland gamebirds, including the Ruffed Grouse, Greater Prairie Chicken, Wild Turkey, and Ring-Necked Pheasant. Similarly, many small mammals eat the seedheads and/or foliage, including the Cottontail Rabbit,

Groundhog, Thirteen-Lined Ground Squirrel, and Meadow Vole. Among the hoofed browsers, the foliage of Red Claver is readily eaten by deer, horses, cattle, and sheep.

The value of Red Clover to wildlife and domestic animals is high[1].

Long-tongued bees, including honeybees, visit the flowers of Alsike Clover for pollen and nectar. Many kinds of insects feed on the foliage, including the caterpillars of the butterflies Clouded Sulfur, and Orange Sulfur. The caterpillars of many moths also feed on the foliage and other parts of the Alsike Clover plant. Because the foliage contains oxalic acid, it is mildly toxic to some mammalian herbivores if it is eaten in sufficientother clovers. The foliage, flowerheads, and seedpods are eaten by upland gamebirds, including the Greater Prairie Chicked, Wild Turkey, and Bobwhite Quail. The Horned Lark and Thirteen-Lined Ground Squirrel also eat the seedpods[1].

The caterpillars of the moth Many-Lined Wainscot, and the butterfly Little Wood Satyr feed on the foliage of Orchard Grass. Its seeds are eaten sparingly by some granivorous songbirds, including the Horned Lark, and Chipping Sparrow. Hoofed mammalian herbivores graze on Orchard Grass. The foliage also provides cover for small mammals[1].

Although tall fescue is not native to Illinois, it is a common plant that occurs in probably every county in Illinois. Tall fescue (*Festuca arundinacea Schreb*.) is the most important cool-season grass in the United States, providing the primary ground cover on some 35 million acres[2]. It is a versatile perennial used for livestock feed, various turf purposes, and for erosion control[2]. Commonly referred to as simply "fescue", this widely adapted, persistent grass is easy to establish, tolerant of a wide range of management regimes, and produces good forage yields[2]. The caterpillars of the skipper *Atalopedes campestris* (Sachem) feed on the foliage of *Festuca spp.* (Fescue Grasses) [2]. This type of fescue is excellent for its proposed use of controlling erosion within waterways.

Wheat, Spring Oats, German Millet and Japanese Millet are all highly desirable cover crops used extensively to benefit agriculture and wildlife in Illinois. They help to reduce wind and water erosion, conserve soil moisture, and increase organic matter, all of which result in better soil structure. These cover crops also provide abundant shelter and nutrients to foraging wildlife, including deer, rabbit, pheasant, insects and birds.

All of the listed species also provide excellent ground cover necessary to control erosion.

Please refer to the following Standard Seed Mixtures table.

STANDARD SEED MIXTURES

Wildlife Herbaceous	**Lb./Ac.**
Korean Lespedeza	**10**
Red or Alsike Clover	**5**
Two (2) or more of the following:	
Big Blue Stem	**4**
Indian Grass	**4**
Side Oats Gramma	**4**
Little Blue Stem	**4**
Switch Grass	**2**
Cover Crop	*****

Waterways	**Lb./Ac.**

Fescue (Endophyte Free) 20
Orchard grass 10
Cover crop ..... *

*** 3 Bu./Ac. Wheat (fall)**
3 Bu./Ac. Spring Oats (spring)
30 lbs./Ac. Sudex/Sudangrass or equivalent summer annual

(1) http://www.illinoiswildflowers.info/index.htm
(2) http://www.caf.wvu.edu/~forage/fescue_endophtye/Story.htm

1) D) 2) b) For forestry and/or wildlife habitat areas, list the planned species and density on a per acre basis of trees, shrubs and herbaceous cover to be seeded and planted.

No forestry or woody wildlife plantings are proposed. The following is the species list and density of the herbaceous wildlife plantings:

Wildlife Herbaceous	**Lb./Ac.**
Korean Lespedeza	**10**
Red or Alsike Clover	**5**
Two (2) or more of the following:	
Big Blue Stem	**4**
Indian Grass	**4**
Side Oats Gramma	**4**
Little Blue Stem	**4**
Switch Grass	**2**
Cover Crop	*****

*** 3 Bu./Ac. Wheat (fall)**
3 Bu./Ac. Spring Oats (spring)
30 lbs./Ac. Sudex/Sudangrass or equivalent summer annual

1) D) 3) Describe the methods to be used in planting and seeding. Include the type of equipment to be used for seeding and seedbed preparation.

After final grading of the affected areas, the wildlife areas will receive herbaceous ground cover by broadcast seeding, and incorporation methods using standard agricultural equipment.

1) D) 4) Is irrigation proposed? If so discuss. Are pest and disease control measures proposed? If so discuss.

Irrigation is not proposed. No pest and disease control is proposed. If pest and disease control measures become necessary, appropriate technical assistance will be obtained.

1) D) 5) Are areas to be temporarily seeded and/or mulched to control erosion?
Yes **X** No _____

Temporary seed mix and mulching will consist of the following. Spring – 3 bu./Ac. Oats, Summer – 30 lbs./Ac. Sudex/Sudangrass or equivalent summer annual, Fall – 3 bu./Ac.

Wheat. Straw mulch or straw bales and/or a combination of both will be used for small critical areas and erosion control structure repairs.

If no, explain. If yes discuss in detail, including species, seeding rate by species per acre, mulching methods, mulching rates and type of mulch.

1) D) 6) Provide Measures proposed to be used to determine success of revegetation required under 62 Ill. Adm. Code 1817.117.

Measures to be used to determine success of re-vegetation on the reclaimed areas will be the Illinois Department of Natural Resources, Office of Mines and Minerals, Permanent Program Rules and Regulations.

1) D) 7) If any of the post-mining land uses are to include industrial or residential uses, describe revegetation measures to control erosion.

N/A

1) D) 8) Are there any plans to use nurse crops or crop rotations to improve future rowcrop productivity?
Yes _____ No **X**

If yes describe type, duration and management of these areas.

1) D) 9) Describe soil testing plan for evaluation of soil nutrients and amendments necessary for revegetation.

An agronomist or soil scientist will be consulted concerning soil nutrients and amendments necessary for achieving the re-vegetation and productivity requirements for final bond release.

1) E) Describe measures to be employed to maximize the use and conservation of the coal resources per regulation Section 1817.59.

The operator intends to recover all coal reserves that are economically feasible to mine at this time by room and pillar mining methods. After mining by this operation, there should be no significant amount of reserves left in the mining area that would warrant interests in future mining by today's standards.

1) F) Describe measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with Section 1817.89 and 1817.102(f). Provide a description of contingency plans which have been developed to preclude sustained combustion of such materials.

Non-coal waste material will be stored and disposed in accordance with the provisions set forth in Section 1817.89. Grease, lubricants, paints and flammable liquids will be removed from the site by a licensed waste hauler.

Openings to the underground mine workings will be sealed as discussed in the response to the following question.

1) G) Describe the measures including cross-sections and maps to be used to seal or manage mine

openings, and to plug, case, or manage exploration holes, other bore holes, wells and other openings within the proposed permit area.

The permittee will comply with 30 CFR 75.1711 of the federal regulations in regard to sealing all openings to the mine. The slope entry and air shafts to the mine will be backfilled and sealed with non-combustible, non-toxic, non-acid forming earthen materials. A poured concrete seal, backed by steel stopping and securely anchored to the roof, floor and coal rib will be installed approximately 10 feet into the slope entry. The concrete seals will provide an additional barrier to seepage of surface water into the abandoned works. Earthen backfill will be placed behind the seal. The intake and return air shafts will be sealed with a concrete cap in accordance with Sections 1817.13 and consistent with 30 CFR 75.1711.

Any well or drill hole established for any reason on this permit area will be properly cased and protected to prevent contamination of the groundwater. Upon abandonment, any such well or drill hole will be sealed with grout or other acceptable material in accordance with Sections 1817.13 and consistent with 30 CFR 75.1711.

No bore holes are currently proposed for this operation. However, all future bore holes (if any) within the permit area which extend beneath a coal seam and into water- bearing strata shall be permanently plugged unless the bore holes have been approved for use as a groundwater well.

1) H) Provide a description of the steps to be taken to comply with the requirements of the Clean Air Act (42 U.S.C. 7401 et seq.), and other health and safety standards.

All applicable air and water quality laws and regulations will be met by use of one or more of the following:

1) Applying a wearing course of durable non-toxic material to all access roads or other heavily traveled areas.

2) Watering or sealing of all heavily traveled areas during dry or dusty periods.

3) The dust control system at the coal processing facility will include a high pressure water mist spray system. A chemical surfactant system can be added later if necessary. The system includes a surge water tank, high pressure water pumps, chemical injection metering pumps with relief valves and controls, and spray manifolds at each dust suppression station. Dust suppression will be applied at all conveyor transfer points, the crusher discharge, and the reclaim points in both reclaim tunnels. Additional dust suppression will use "rainbird" type sprinklers mounted on the stacking tubes.

4) All disturbed areas will have, at all times, drainage control structures that are in proper working order, that provides adequate treatment to comply with the applicable water quality standards.

5) Immediately after final re-grading, preparations for the seed bed will begin and re-vegetation will be accomplished.

2) Post Mining Land Use

2) A) Provide a detailed description of proposed post-mining land uses employing the land use categories listed below. Provide acreage figures for each post-mining land use proposed and designate the post-mining land uses on the Post Mining Land Use Map.

Bulldog Mine
Post-Mining Land Use/Capability
Acreage Table

Permit Area				
Land Use	**Capability**	**Pre-Mining**	**Post-Mining**	**Change**
Cropland	Prime Farmland	389.0		-389.0
Industrial/Commercial	Prime Farmland	1.3		-1.3
Herbaceous Wildlife	High Capability	0.0	305.9	+305.9
Herbaceous Wildlife	Limited Capability	0.0	84.4	+84.4
Support Area Total		390.3	390.3	

2) B) 1) Provide a description of how the proposed post-mining land uses are to be achieved, and describe any necessary support activities which will be needed to achieve the proposed land uses.

Wildlife habitat will be re-established through approved herbaceous species plantings. Seedbed preparation and fertilization will be employed as necessary to insure adequate stand establishment.

2) B) 2) Discuss the utility and capacity of the reclaimed lands to support a variety of alternative uses and the relationship of the proposed uses to existing land use policies and plans.

The reclaimed land will have the potential to support a variety of future uses, which could include cropland, pasture and/or forestry, but will generally be reclaimed to support their intended uses. Reclaimed herbaceous wildlife habitat will be well suited to support wildlife, recreational and sporting activities.

2) B) 3) Where grazing is the proposed post-mining land use, explain the detailed management plans to be implemented, if any.

Grazing or pasture areas are not proposed.

2) B) 4) Where a post-mining land use different from a pre-mining land use is proposed alternate post-mining land uses may be approved by the Department after considering the relationship of the intended uses to the existing land use policies and plans and the comments of any owner of the surface, and land use agency having jurisdiction over the land.

Provide a discussion explaining the consideration which has been given to making all of the proposed surface mining activities consistent with surface owner plans and applicable State and local land use plans and programs.

The Post-Mining Land Use/Capability Acreage Table above shows the planned changes from pre-mining to post-mining land uses and capabilities.

The proposed reclamation plan results in a loss of 390.3 acres of prime farmland. In

accordance with 62 Ill. Adm. Code 1823.11(a) and (b) this loss is justifiable because, a) part of the 390.3 acres loss are located within areas occupied by the coal preparation plant and associated coal stockpiles, support facilities, and mine roads that will be actively used over extended periods of time and where uses affect minimal amount of land. Such uses meet the requirements of 62 Ill. Adm. Code 1817 for underground mining activities, and b) the remaining acres of the 390.3 acre loss are located within areas occupied by disposal sites containing coal mine waste resulting from underground mining that is not technologically and economically feasible to store in underground mines or on non-prime farmland.

The refuse area acreage will be reclaimed to limited capability herbaceous wildlife habitat. Acid or toxic producing material in the refuse pile will be treated with lime and covered with 36" of sub-soil and 12" of topsoil. The other non- toxic/non-acid producing areas affected by the surface facilities will be covered with an average of 12" of topsoil.

The current owner of the property, Sunrise Coal, LLC., has been consulted regarding the proposed post-mining land uses. The current owner of the property approves of the post-mining reclamation plan. State and local agencies will have the opportunity to comment on the plan during the permit review process.

The proposed land use/capability changes do not present any actual or probable hazard to the public health and safety, nor do they pose any threat to water diminution or pollution. The changes will allow maximum recovery of the coal resources, and will facilitate both practical and reasonable future land management.

2) C) Provide a copy of the comments concerning the proposed land use by the owner of the surface of the proposed permit area and by the State or local government agencies which would have to initiate, implement, approve or authorize the proposed uses of the land following reclamation.

The current owner of the property, Sunrise Coal, LLC, has been consulted regarding the proposed post-mining land uses. The current owner of the property approves of the post-mining reclamation plan.

State and local agencies will have the opportunity to comment on the plan during the permit review stage.

3) A) Provide a fish and wildlife protection and enhancement plan meeting the requirements of 62 Ill. Adm. Code 1817.97 and which shall include the following:

Several documents are included herein regarding fish and wildlife, streams, and wetlands site specific resource information within the permit area. These documents were prepared by a qualified Wildlife Biologist on staff with Midwest Reclamation Resources, Inc. Shawn Duncan is the staff Wildlife Biologist for Midwest Reclamation Resources, Inc. He received a Bachelor's of Science from Purdue University in Wildlife Science in 2005. Additionally, he received a Master's of Science from Southern Illinois University Carbondale in Zoology in 2011. He has eight years of experience conducting vegetation and animal surveys and is qualified to conduct surveys and make habitat determinations for Endangered and Threatened Species within Illinois. Additionally, he has been trained and certified in conducting wetland delineations and other aspects of the Clean Water Act through the Richard Chinn Environmental Training program. Descriptions of methodologies used to collect and analyze the data are outlined in the various site specific resource information documents included herein.

3) A) 1) A statement of the protective measures that will be used to minimize disturbances and adverse impacts on fish and wildlife and related environmental values during surface coal mining operations.

The mining operation will comply with all applicable rules and regulations. The rules and regulations provide a comprehensive set of environmental protection measures for controlling adverse ecological impacts resulting from coal mining.

The control measures include considerations for air, water, acid/toxic producing materials, soils, vegetation and erosion control, etc., in both special and temporal capacities. In general, the protective measures that will be employed at this mine site are inherent within the permanent program regulations.

This mining facility will limit mining related disturbance to only the acreage that is necessary to perform mining operations compliant with all applicable mining regulations. Surface disturbances not required for mining related activities will be minimal.

Based on the attached resource information documents there are no wildlife habitats or areas of unusually high value for fish and wildlife within or surrounding the permit area. There is no predicted impact to State or Federally Listed endangered or threatened species.

In accordance with 62 Ill. Adm. Code 1817.97(e)(1), electric powerline and other transmission facilities used for, or incidental to, underground mining activities on the permit area will be designed and constructed to minimize electrocution hazards to raptors. *Attachment V-3A1* provides a protective measures plan that will minimize electrocution hazards to raptors caused by improperly designed and constructed electric powerlines.

3) A) 2) Discuss the enhancement measures that will be used during the reclamation and post mining phase of the operation to develop aquatic and terrestrial habitat.

Following surface operations the entire permit area (390.3 acres) will be reclaimed to herbaceous wildlife. The standard seed mix of native warm-season grasses and soil-building legumes will be used to establish a warm-season prairie. The warm-season prairie in the permit area will provide extensive habitat for grassland birds such as Henslow's Sparrow, Grasshopper Sparrow, Field Sparrow, Dickcissel, Bobolink, Eastern Meadowlark, Northern Harrier, Eastern Kingbird, Sedge Wren, Upland Sandpiper, and other open land species.

There are no aquatic habitats planned to be reclaimed within the permit area.

3) A) 3) If the applicant's fish and wildlife plan finds it impracticable to provide for enhancement of fish and wildlife and related environmental values, the applicant shall provide a statement which establishes why it is not practical to achieve enhancement.

Not applicable.

3) B) The applicant shall provide a statement explaining how impact control measures, management techniques, and monitoring methods will be utilized to protect or enhance the following, if they are to be affected by the proposed surface coal mining and reclamation operations:

3) B) 1) Threatened or endangered species of plants or animals listed by the Secretary of the United States Department of the Interior (Secretary) under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) and their critical habitats.

The staff wildlife biologist of Midwest Reclamation Resources, Inc. conducted field work and prepared a site specific resource report to determine the existence of threatened or endangered species of plants or animals within and adjacent to the permit area. The report is included in *Attachment V-3B1*. Based on the findings of the site specific resource reports there are no federally endangered or threatened species within or adjacent to the permit area; therefore, no protection and enhancement plans were required.

3) B) 2) Species such as eagles, migratory birds or other animals protected by State or Federal law, and their habitats; or other species identified through the consultation process pursuant to 62 Ill. Adm. Code 1784.21; or

The staff wildlife biologist of Midwest Reclamation Resources, Inc. conducted field work and prepared site specific resource reports to determine the potential impact of the proposed project upon eagles, migratory birds or other animals protected by State or Federal law and their habitats. The report is included in *Attachment V-3B1*. Based on the findings of the site specific resource reports there are no potential impacts to eagles, migratory birds or other animals protected by State or Federal law and their habitats within or adjacent to the permit area; therefore, no protection and enhancement plans were required.

3) B) 3) Habitats of unusually high value for fish and wildlife, such as wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, reproduction and nursery areas, and wintering areas.

The staff wildlife biologist of Midwest Reclamation Resources, Inc. conducted field work and prepared site specific resource information to determine the existence of habitats of unusually high value for fish and wildlife within and adjacent to the permit area. The reports are included in *Attachment V-3B1* and *Attachment V-3B3*. Based on the findings of the site specific resource reports there are no habitats of unusually high value for fish and wildlife, such as wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, reproduction and nursery areas, or wintering areas within the permit area; therefore, no protection and enhancement plans are required.

The Louisville District, U.S. Army Corps of Engineers (USACE) has been contacted to confirm the wetlands and streams report's findings and the necessity to obtain a Section 404 permit. No wetlands were identified within the permit area; therefore, compensatory mitigation will not be conducted.

3) B) 4) For the Indiana Bat, Myotis sodalis, include an assessment of potential or known breeding and/or wintering habitat in the proposed permit area. Identify any mitigation measures necessary to prevent loss of critical habitat, and to prevent potential "taking" (killing) of the animal, i.e., restricting timber removal to those seasons when the bat is not present in Illinois.

The staff wildlife biologist of Midwest Reclamation Resources, Inc. conducted field work and prepared site specific resource information to determine the existence of Indiana bat habitat within and adjacent to the permit area. The report is included in *Attachment V-3B1*. Based on the findings of the site specific resource reports there is no Indiana bat habitat within the permit area; therefore, no protection and enhancement plans were

required.

4) Pond, impoundments, banks, dams and embankments.

4) A) Permanent impoundments, including sedimentation ponds, must be authorized by the Regulatory Authority based upon the requirements of Section 1817.49(a) and (b).

4) A) 1) Include sufficient design data and calculations to substantiate that the design is in accordance with SCS engineering standard 378 "Ponds" or SCS technical release #60 "Earth Dams and Reservoirs".

Not applicable. No permanent water impounding structures are proposed.

4) A) 2) Provide evidence that water quality is to be suitable for the intended use.

Not applicable. No permanent water impounding structures are proposed.

4) A) 3) Indicate the relationship of the impoundment to the post-mining land use.

Not applicable. No permanent water impounding structures are proposed.

4) A) 4) Describe methods of dropping surface runoff over excavated impoundment sideslopes. Discuss design criteria to be employed for downdrain structures and perimeter diversions.

Not applicable. No permanent water impounding structures are proposed.

4) A) 5) Provide plans of access roads and other use related facilities.

Not applicable. No permanent water impounding structures are proposed.

4) B) Describe proposed reclamation for all refuse disposal areas including timing of final coverage, depth of final cover, restoration planned for disposal area and restoration planned for borrow areas.

After all refuse generated by coal processing has been disposed of in the approved manner, toxicity testing will be performed to determine the net neutralization potential of the waste material. Lime, if determined to be necessary, will be incorporated into the surface of the refuse before covering it with 4 feet of non-toxic, non-combustible soil materials. Cover material will be obtained from soil stockpiles constructed at the time of initial disturbance. Soil borrow areas are not anticipated to be necessary. It is believed that sufficient volume of soil will be available in the stockpiles.

4) C) If any structure is 20 feet or higher or impounds more than 20 acre-feet, provide a stability analysis of each structure which shall include strength parameters, pore pressures, and long-term seepage conditions. Also, to be included is a description of each engineering design assumption and calculation with a discussion of each alternative considered in selection design parameters and construction methods.

The Refuse Impoundment meets these criteria. Patriot Engineering and Environmental, Inc. recently completed fieldwork necessary to provide analyses for the foundation and stability design of the Refuse Impoundment. A copy of their findings is included herein as *Attachment IV-6B*.

4) D) Submission of MSHA certification documents for a detailed design plan shall satisfy the requirements, in so far as, the MSHA informational and design standard requirements are duplicative of the requirements.

5) Area closure or abandonment.

5) A) Describe all reclamation efforts to be expended to satisfy the requirements of abandonment. If an exemption request is to be made, it should be included.

5) A) 1) Include the timing to meet the final grading and revegetation requirements.

When permanent cessation of the mining operation occurs, final reclamation of the mine site will begin. The area will be reclaimed in accordance with the approved reclamation plan, and the permanent program rules and regulations that exist at that time.

Following recovery of the useable underground mining equipment, the underground shafts and slope entries will be backfilled and sealed. Surface facilities and structures not required to support the approved post-mining land use will be removed. Salvageable structures and materials will be sold if economically possible. Obsolete structures and materials will be removed from the mine site and deposited in an approved landfill. Affected areas will be graded to conform to the approved reclamation plan.

Soil replacement and establishing vegetation are dependent on seasonal weather conditions. To obtain optimum efficiency and avoid undesirable compaction, soil replacement will be accomplished during the dryer summer. Soil materials required for final reclamation will be obtained from stockpiled soil that was removed from the site prior to disturbing the area by mining activity. It is anticipated that sufficient soil material will be stockpiled so that additional borrow areas will not be necessary to complete final reclamation. However, the permittee will solicit Department approval should it become apparent at a later time that borrow areas are necessary to complete required reclamation. Reclaimed areas will be seeded during the first normal planting period following soil replacement. Soil will be replaced, and vegetation established in accordance with the approved post-mining land uses.

Surface water and groundwater monitoring will continue at the site as required until approval is obtained from the proper regulatory agencies to discontinue monitoring.

5) A) 2) Include a description of the final graded slopes, and the type of seed and seeding.

Backfilling, grading and soil replacement will be accomplished with dump trucks, dozers, tractor/scrapers and road graders. Disturbed areas, except for the Refuse Impoundment, will be restored to approximate original contour. This will be accomplished by blending the disturbed areas with the natural ground surface of the undisturbed areas during the grading process then replacing topsoil on the disturbed areas.

The out slopes of the Refuse Impoundment will not exceed 3H:1V. After all coarse refuse waste material generated by coal processing has been disposed of in the Refuse Impoudment, toxicity testing will be performed to determine the net neutralization

potential of the waste material. Lime, if determined to be necessary will be incorporated into the surface of the Refuse Impoundment before covering the waste material with 4 feet of non-toxic, non-combustible soil materials.

Seed species and application rates are listed in the Standard Seed Mixture table found earlier in Part V.

5) A) 3) Explain final coverage of treatment of toxic areas and locate all borrow pits.

Please refer to the previous response for a discussion of treatment for potentially toxic materials in the Refuse Impoundment. No borrow pits are currently anticipated.

5) B) Describe in detail a rehabilitation design plan for each siltation structure, diversion, impoundment and treatment facility to be implemented and completed prior to abandonment. Any departures from detailed design plan requirements must be designated as such and be accompanied by supporting documentation.

After completion of mining and final reclamation, the permittee will solicit approval from IDNR-OMM and IEPA to reclassify Sediment Pond #1, Freshwater Ponds #1 and #2, and Treatment Ponds #1 and #2 to reclamation drainage standards. After compiling sufficient monitoring data to demonstrate continued surface water quality compliant with applicable water quality standards, the Ponds will be reclaimed.

Reclamation will begin by dewatering the ponds. A sufficient amount of soil material will be hauled in from soil stockpiles and deposited in the ponds to approximate original contours. This will be accomplished by blending the disturbed areas with the natural ground surface of the undisturbed areas during the grading process then replacing topsoil on the disturbed areas.

6) Perennial and Intermittent Stream Diversion Note: If stream diversion is not planned, indicate N/A.

Not applicable. There are no perennial or intermittent stream diversions proposed.

6) A) Overview, Alternative, Justification:

6) A) 1) Discuss in detail the reasons for diverting the stream. Include justification and possible alternatives to relocating it.

6) A) 2) Discuss the general overview of the proposed diversion project. General information should include: temporary, permanent; time length of diversion; single phase, multiphase; restore on placeland, restore in approximately original location after mining; etc.

6) B) Pre-disturbance information

6) B) 1) The following general information shall be provided for the stream to be diverted:

6) B) 1) a) Name of the stream to be diverted,

6) B) 1) b) Classification (intermittent, perennial),

6) B) 1) c) Total length of segment affected,

6) B) 1) d) Total drainage area of existing stream at the point where relocation begins (miles) and ends (miles),

6) B) 1) e) Depth of the water table adjacent to the stream and yearly fluctuation.

6) B) 2) An aerial photograph or map (scale at 1 in = 400 ft or other approved scale) shall be provided illustrating the following for the existing stream:

6) B) 2) a) Existing stream channel and adjacent land use,

6) B) 2) b) Watershed limits upstream of the proposed relocation,

6) B) 2) c) Proposed permit area; property boundaries,

6) B) 2) d) An outline of the 100-year and 2-year frequency flood plains along the existing channel; include the acreage inundated by each storm event,

6) B) 2) e) Locations where representative cross-sections have been taken

6) B) 2) f) Riparian habitat (vegetation),

6) B) 2) g) Riffles, list total number and locate on the map or photo,

6) B) 2) h) Pools; list total number and locate on the map or photo,

6) B) 2) i) Meanders; list total number and locate on the map or photo.

6) B) 3) Plan-profile and cross-sectional drawings of the existing stream shall be provided showing the following information:

6) B) 3) a) Stream bed and significant drops,

6) B) 3) b) Water surface at low flow,

6) B) 3) c) Water surface at the 100 year and 2 year flood event.

Include the calculated flow rate (cfs) and velocity (ft/sec) at the representative locations for low flow and the 100-year flood conditions.

6) B) 4) Describe the habitat of the existing stream including the following information at a minimum:

6) B) 4) a) Channelization or other disturbances,

6) B) 4) b) Shade provided by stream bank vegetation,

6) B) 4) c) Stream substrate composition,

6) B) 4) d) Steepness and elevation of the banks,

6) B) 4) e) Riparian vegetation (species, relative abundance),

6) B) 4) f) Aquatic vegetation (species, relative abundance),

6) B) 4) g) Potential Indiana bat habitat shall be addressed with a plan to prevent "taking" of the animal during breeding seasons.

6) C) The following design and construction plan information shall be provided for TEMPORARY STREAM CHANNEL DIVERSIONS. If none are proposed, indicate N/A.

6) C) 1) The following estimated construction planting dates shall be provided:

a) Begin construction _____

b) End construction _____

c) Begin planting _____

Give a detailed description of the construction practices to be followed, and the equipment to be employed.

6) C) 2) After stabilization of the temporary diversion and prior to diversion of the existing stream into the temporary stream channel, the applicant will be required to contact the Department and gain approval. The applicant shall provide an estimation of the date when erosion control structures and vegetation will be sufficiently established to allow diversion of the water into the temporary channel.

6) C) 3) Discuss the erosion control practices to be followed during construction of the temporary diversion and the features of the proposed channel which will help minimize erosion of the stream banks in the future. Discuss the necessity, if any, of using a stilling basine to aid in reducing siltation.

6) C) 4) Discuss the impacts the temporary diversion ditch will have on downstream water quality, biological communities and water users and describe a monitoring program to measure these impacts.

6) C) 5) Describe reclamation of temporary stream diversions when no longer needed.

6) C) 6) A detailed revegetation plan shall be proposed, including soil preparation procedures, plant species and rates, fertilizer rates and mulching rates.

6) C) 7) Describe how the temporary diversion ditch spoil will be handled to minimize the impact on the surrounding area.

6) C) 8) Provide an aerial photo or map (scale of 1 in = 400 ft) illustrating the following:

6) C) 8) a) Proposed temporary stream channel diversion.

6) C) 8) b) Proposed spoil locations.

6) C) 8) c) An outline of the 10-year frequency flood plain along the proposed temporary diversion.

6) C) 8) d) Locations where representative cross-sections have been taken.

6) C) 9) Design information shall be provided as follows:

6) C) 9) a) Plan-profile drawings clearly depicting locations and flow line slopes.

6) C) 9) b) Sufficient cross-sections to depict side slopes and inflection points such as cuts and fills.

6) C) 9) c) A clearly outlined drainage area which the temporary diversion ditch will serve including hydrologic characteristics such as slopes, soil types, vegetative cover, etc.

6) C) 9) d) Detailed calculations of runoff volumes from the drainage area upon which to base ditch sizing calculations.

6) C) 9) e) Detailed ditch sizing calculations to demonstrate the projected temporary stream channel diversion ditch is adequate to convey the 10-year 24 hour storm event pursuant to Sections 1817.43(c) and (f).

6) D) The following design, construction and restoration plan information shall be provided for the PERMANENT RESTORED STREAM (_____) or the PERMANENT RELOCATED STREAM CHANNEL (_____), which ever is applicable. Check the appropriate category.

6) D) 1) The following estimated construction dates shall be provided:

6) D) 1) a) Begin construction _____

6) D) 1) b) End construction _____

6) D) 1) c) Give a detailed description of the construction practices to be followed, and the equipment to be employed.

6) D) 1) d) A program shall be established to regularly report on the progress of the permanent stream channel reconstruction including as-built designs of the channel and flood plain and a description of habitat restoration. Discuss the timing and content of the proposed restoration progress report program.

6) D) 2) Describe how the new channel spoil will be graded and handled to minimize the impact on the surrounding area, including the flood plain capacity, flooding and the riparian zone.

6) D) 3) After the restored channel is adequately stabilized and prior to diversion of the temporary diversion ditch into the permanently restored stream channel, the applicant will be required to contact the Department and gain approval. The applicant shall provide an estimation of the date diversion of the water into the permanent channel.

6) D) 4) Discuss the erosion control practices to be followed during construction of the permanent stream restoration and the features of the proposed channel when will help minimize erosion and enhance stability of the stream banks in the future.

6) D) 5) Discuss the impacts the permanently restored stream channel will have on downstream water

quality, biological communities and water users and describe a monitoring program to measure these impacts.

6) D) 6) Provide an aerial photo or map (scale of 1 in = 400 ft) illustrating the following:

6) D) 6) a) Proposed permanently restored stream channel,

6) D) 6) b) Proposed spoil locations,

6) D) 6) c) An outline of the 100-year and 2-year frequency flood plains along the proposed permanent restored channel,

6) D) 6) d) Locations where representative cross-sections have been taken,

6) D) 6) e) Riparian habitat (vegetation),

6) D) 6) f) Riffles; list total number and locate on the map or photo,

6) D) 6) g) Pools; list total number and locate on the map or photo,

6) D) 6) h) Meanders; list total number and locate on the map or photo,

6) D) 7) Design information shall be provided as follows:

6) D) 7) a) Stream bed and significant drops,

6) D) 7) b) Water surface elevations at low flow,

6) D) 7) c) Water surface elevations at the 100-year and 2-year floods,

6) D) 7) d) Gradeline for the proposed restored stream channel,

6) D) 7) e) Plan-profile drawings clearly depicting locations and flow line slopes,

6) D) 7) f) Sufficient cross-sections to depict side slopes and inflection points such as cuts, fills, curves and straight sections,

6) D) 7) g) A clearly outlined drainage area which the permanent channel will serve including hydrologic characteristics such as slopes, soil types, vegetative cover, etc.,

6) D) 7) h) Detailed calculations of runoff volumes from the drainage area upon which to base channel sizing calculations,flood plain are adequate to convey the 100-year 24 hour storm event.

6) D) 7) i) Detailed channel sizing calculations to demonstrate the projected permanent channel and

6) D) 7) j) Include the calculated flow rate (cfs) and velocity (ft/sec) at the representative locations for low flow and the 100-year flood condition.

6) D) 8) Describe other habitat restoration methods to be employed as follows:

6) D) 8) a) Provide typical plans, maps and drawings for boulder deflectors, check dams, current

deflectors or other in-stream habitat structures, if any,

6) D) 8) b) Provide typical plans, profiles and cross-sections for proposed floodplain potholes and/or wetlands, if any,

6) D) 8) c) A detailed revegetation plan shall be proposed, including soil preparation procedures, plant species and rates, fertilizer rates and mulching rates. Provide details on riparian habitat revegetation including a discussion of the herbaceous ground cover, woody species to be planted and the number and distribution of the stems to be planted. The riparian zone must be reclaimed to forest with a minimum of 450 trees/acre necessary for bond release,

6) D) 8) d) If the restored stream will traverse inclines or final cuts, provide measures to be employed to enhance the diversity of the impoundments.

7) Are coal processing wastes proposed to be returned to abandoned underground workings?
Yes _____ No **X**

If the response above is yes, provide information required under 62 Ill. Adm. Code 1784.25(a) through (f).

Sunrise Coal, LLC
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ATTACHMENT V-1B

RECLAMATION COST ESTIMATE

Total Reclamation Cost = $1,305,471.00

Mine Slope - $1,905.00

Backfill Slope - $105.00

Scope of Work – Backfill slopes 15' W x 10.5' H x 10'L = 58 cu. yds.
Equipment – Equipment – D5 LGP Dozer @ $70.00/hour
Productivity – Assume 50 cu yds per dozer hour
Cost Estimate – (58 cy)(1.20% swell)/(50 cy/per hr.) = 1.5 hrs X $70.00/hr = $105.00

Seal Slope- $1,800.00

Scope of Work – Seal slope 15' W x 10.5' H x 2' T
Equipment – Contract equipment and labor for concrete stopping @ $150.00/cu. yd.
Cost Estimate – 12 cu. yds. Concrete ($150.00/cu. yd.) = $1,800.00

2 Air Shafts - $7,470.00

Backfill Shafts - $2,970.00

Scope of Work – Backfill 2 shafts (16' Dia. x 365') 5,433 cu. yds.
Equipment – Equipment – D10 LGP Dozer @ $90.00/hour
Productivity – Assume 200 cu yds per dozer hour
Cost Estimate – (5,433 cy)(1.20% swell)/(200 cy/per hr.) = 33 hrs X $90.00/hr = $2,970.00

Seal Shafts- $4,500.00

Equipment – Contract equipment and labor for concrete cap @ $150.00/cu. yd.
Cost Estimate – 30 cu. yds. Concrete ($150.00/cu. yd.) = $4,500.00

Road Removal - $7,275.00

Road Removal - $7,275.00

Scope of Work – Remove 15,256 LF x 20'W x 1'D road rock. Dispose of road material in mine slopes/air shafts.
Average 3500' one way haul distance
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 7 loads/hour @ 20 cy/load = 140 cy/hour
Cost Estimate – (11,300 cu yds)(1.20 % swell)/140 cy/hr = 97 hrs X $75.00/hr = $7,275.00

Pond Elimination - $296,625.00

Backfill Freshwater Pond #1-$96,825.00

Scope of Work – Backfill 193,600 cubic yards (includes topsoil) and blend with surrounding topography. Average 1,000' one way haul distance.
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 9 loads/hour @ 20 cy/load = 180 cy/hour
Cost Estimate – (193,600 cy)(1.20 % swell)/180 cy/hr=1,291 hrs X $75.00/hr = $96,825.00

Backfill Freshwater Pond #2-$15,525.00

Scope of Work – Backfill 30,976 cubic yards (included topsoil) and blend with surrounding topography. Average 1,000' one way haul distance.
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 9 loads/hour @ 20 cy/load = 180 cy/hour
Cost Estimate – (30,976 cy)(1.20 % swell)/180 cy/hr = 207 hrs X $75.00/hr = $15,525.00

Backfill Sediment Pond #1-$18,900.00

Scope of Work – Backfill 37,752 cubic yards (includes topsoil)and blend with surrounding topography. Average 1,000' one way haul distance.
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 9 loads/hour @ 20 cy/load = 180 cy/hour
Cost Estimate – (37,752 cy)(1.20 % swell)/180 cy/hr = 252 hrs X $75.00/hr = $18,900.00

Backfill Treatment Pond #1-$104,850.00

Scope of Work – Backfill 209,733 cubic yards (includes topsoil) and blend with surrounding topography. Average 1,000' one way haul distance.
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 9 loads/hour @ 20 cy/load = 180 cy/hour
Cost Estimate – (209,733 cy)(1.20 % swell)/180 cy/hr =1,398 hrs X $75.00/hr = $104,850.00

Backfill Treatment Pond #2-$60,525.00

Scope of Work – Backfill 121,000 cubic yards (includes topsoil) and blend with surrounding topography. Average 1,000' one way haul distance.
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 9 loads/hour @ 20 cy/load = 180 cy/hour
Cost Estimate – (121,000 cy)(1.20 % swell)/180 cy/hr = 807hrs X $75.00/hr = $60,525.00

Coarse Refuse Pile/Slurry Impoundment – $519,665.00

Minor Grading and Shaping - $29,540.00

Scope of Work – Clean up site and bury debris prior to applying lime and covering refuse.
Equipment – D5 LGP Dozer @ $70.00/hour
Productivity – Assume 5 dozer hours/acre
Cost Estimate – 84.4 ac. (5 hrs/ac.)($70.00/hr) = $29,540.00

Replace Topsoil - $490,125.00

Scope of Work – Cover 84.0 acres with 48" of soil from stockpiles.
Average 1,500' one way haul distance
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 5 loads/hour @ 20 cy/load = 100 cy/hour
Cost Estimate – 84.4 ac. (6,452 cy/ac.)(1.20 % swell)/100 cy/hr = 6,535 hrs X $75.00/hr =$490,125.00

Coal Preparation Plant/Stockpiles – $10,200.00

Remove Structures - $0

No reclamation liability costs are anticipated for structure removal. Previous experience while reclaiming idled coal mines in the area indicates the coal handling structures, including conveyor belts, can be sold to private individuals for scrap value.

Remove Waste Material - $10,200.00

Scope of Work – Remove 4.5 acres x 3' thick of fine coal waste and crushed rock from the area @ and dispose in shafts.
Average 1,800' one way haul distance
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 8 loads/hour @ 20 cy/load = 160 cy/hour
Cost Estimate – 4.5 ac. (4,839 cy/ac.)/160 cy/hr=136 hrs X $75.00/hr = $10,200.00

Structure Removal – $191,146.00

Remove Buildings - $179,000.00

Scope of Work – Demolish buildings/concrete and dispose in approved land fill.
Shop .....7,800 sq. ft.
Washplant .....4,800 sq. ft.
Office/Bath House .....14,400 sq. ft.
Warehouse .....7,800 sq. ft.
VFD Building .....600 sq. ft.
Transfer Building.....400 sq. ft.
Assume all buildings and structures associated with the coal preparation plant will be removed incidental to prep plant demolition.
Equipment – Contract equipment and labor @ $5.00/sq. ft.
Cost Estimate – 35,800 sq. ft.($5.00/sq. ft.) = $179,000.00

Remove Concrete Structures - $4,732.00

Scope of Work – Demolish concrete and dispose in shafts/slope.
Thickner……155 cu. yd.
Truck Scale…….27 cu. yd.
Equipment – Contract equipment and labor @ $26.00/cu. yd.
Cost Estimate – 182 cu. yd.($26.00/cu. yd.) = $4,732.00

Parking Areas/Supply Yard - $7,414.00

Scope of Work – Remove 19.6 acres of crushed rock from parking lot @ 6" thick and bury on-site. Average 1,000' one way haul distance
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 8 loads/hour @ 20 cy/load = 160 cy/hour
Cost Estimate – 19.6 ac. (807 cy/ac.)/160 cy/hr($75.00/hr) = $7,414.00

Surface Disturbed Areas*- $176,865.00

Rough Grading and Replace Sub-soil - $0

Rough grading and sub-soil replacement will not be necessary. All structures, toxic and acid forming materials, and contaminated soil will be removed from the area while removing and salvaging the coal processing facilities. The remaining material will be used to backfill the shafts and slope entries. No other reclamation efforts are anticipated in preparation for topsoil replacement.

Minor Grading and Shaping - $47,040.00

Scope of Work – Final site clean up and bury debris prior to spreading 12" of topsoil.
Equipment – D5 LGP Dozer @ $70.00/hour
Productivity – Assume 5 dozer hours/acre
Cost Estimate – 113.4 ac. (5 hrs/ac.)($70.00/hr) = $39,690.00

Replace Topsoil - $137,175.00

Scope of Work – Cover 133.4 acres with 12" of topsoil from stockpiles. Average 5,000' one way haul distance
Equipment – 4X4 tractor, w/2-10 cy scrapers @ $75.00/hour
Productivity – 6 loads/hour @ 20 cy/load = 120 cy/hour
Cost Estimate – 113.4 ac. (1613 cy/ac.)(1.20 % swell)/120 cy/hr = 1,829 hrs X $75.00/hr =$137,175.00

**** Surface disturbed areas not including Impoundments and the Coarse Refuse Pile/Slurry Impoundment.***

Re-Vegetation- $94,320.00

Apply Seed and Mulch - $94,320.00

Scope of Work – Plant herbaceous wildlife seed mix. Assume over seeding 20% for additional disturbance beyond item boundaries.
Material and Equipment – Assume historical cost for similar work @ $200.00/acre
Cost Estimate – 390.3 ac. (1.20)($200.00/ac.) = $94,320.00

Sunrise Coal, LLC
Bulldog Mine
Permit No. 429

ATTACHMENT V-3A1

PROTECTIVE MEASURES TO HELP MINIMIZE ELECTRIC POWERLINE ELECTROCUTION HAZARDS TO RAPTORS

Protective Measures to Help Minimize Electric Powerline Electrocution Hazards to Raptors

Introduction

Bird deaths from powerline electrocution were first documented in the 1920's. Since that time, the research directed at preventing those electrocutions has grown and developed along with the United States electric grid. The result has been that many avian/powerline electrocution issues have been resolved by properly designing and constructing electric powerlines.

Biological and behavioral factors unique to raptors put them at greater risk for electrocution from electric utility structures and lines than most birds. To address raptors special needs and provide guidelines for electric utilities, *Suggested Practices for Raptor Protection on Power Lines* was first published by researchers in 1975, later updated in 1981, and most recently revised in 1996 by Edison Electric Institute and the Avian Power Line Interaction Committee in collaboration with the Raptor Research Foundation. The 1996 version (which is recognized internationally by researchers, industry, policymakers, and the public) presents the history and successes of more than two decades of research and implementation of solutions to avian electrocutions. It examines the history of raptor/powerline interactions from biological and electrical perspectives and proposes specific solutions for reducing avian fatalities. Sunrise Coal intends to rely heavily on the recommendations presented in the 1996 version when designing and constructing the electric powerlines that will be used to supply electricity to the Bulldog Mine.

Understanding the Electrical Systems

Powerlines are rated and categorized, in part, by the voltage levels to which they are energized. Because the magnitudes of voltage used by the power industry are large, voltage is often specified with the unit of kilovolt (kV) where 1kV is equal to 1,999 volts (v). Generally, from the point of origin to the end of an electric system, line voltage is used to designate four classes or types of powerlines; generation plant, 12 V to 22 kV; transmission, 60 kV to 700+ kV; distribution, 2.4 kV to 60 kV, and utilization 120 V to 600 V.

In addition to the voltage level, powerline classification is dependent on the purpose of the line. Since this mining operation will not operate a generation plant, and low voltage (≤600 v) utilization lines are not often involved in avian electrocutions (APLIC 2006), the Bulldog Mine is concerned with electrocution hazards posed to birds by transmission lines ≥60 kV, and distribution lines <60 kV.

Generally, the mining industry is powered by three-phase overhead powerline systems that utilize support structures from which insulators and electrical conductors are attached. Support structures usually consist of preservative-treated wood poles. Insulators are made of porcelain or polymer materials that do

Protective Measures to Help Minimize Electric Powerline Electrocution Hazards to Raptors

not normally conduct electricity. Electrical conductors are usually manufactured from copper or aluminum. Three-phase circuits consist of structures, as described, that support at least three electrical phase conductors with or without a neutral (or grounded) conductor. Three-phase systems can be used for both transmission and distribution lines.

Transmission line structures always support at least one three-phase circuit, but can also consist of more than one three-phase circuit supported on the same structure. They have three energized conductors (more if bundled), and may have one or two grounded conductors (usually referred to as static wires) installed above the phase conductors for lightening protection.

Distribution line structures may support a variety of conductor configurations. A distribution line could consist of three phase conductors only, or three separate phase conductors and a single neutral (grounded) conductor. The neutral conductor could be the top-most conductor on the supporting structure or it could be placed below or even with the phase conductors. Distribution lines could also consist of two phase conductors alone or two phase conductors and a neutral conductor, again with the neutral conductor being above, below, or even with the phase conductors. A distribution line may also have just a single phase conductor and a neutral conductor with the neutral being above, below, or even with the phase conductor. However, most distribution lines have the neutral conductor placed below the phase conductors. The neutral conductor is used to complete the electrical circuit and serves as part of the conducting path for phase current flowing from the mine back to the substation where the circuit originates. The earth itself serves as the other part of the return current path.

Avian Electrocutions and Powerline Design

Birds can be electrocuted by simultaneously contacting energized and/or grounded structures, conductors, hardware, or equipment. Electrocutions may occur because of a combination of biological and electrical design factors. Biological factors are those that influence avian use of poles, such as habitat, prey, and avian species. The electrical design factor most crucial to avian electrocutions is the physical separation between energized and/or grounded structures, conductors, hardware, or equipment that can be bridged by birds to complete a circuit. As a general rule, electrocution can occur on structures with the following;

- Phase conductors separated by less than the wrist-to-wrist or head-to-foot (flesh-to-flesh) distance of a bird. The wrist is the joint toward the middle of the leading edge of a bird's wing. The skin covering the wrist is the outermost fleshy part on the wing.
- Distance between grounded hardware (e.g., grounded wires, metal braces) and any energized

Protective Measures to Help Minimize Electric Powerline Electrocution Hazards to Raptors

phase conductor that is less than the wrist-to-wrist or head-to-foot (flesh-to-flesh) distance of a bird.

In the 1970s, Morley Nelson evaluated electrocution risks of eagles to identify configurations and voltages that could electrocute birds (Nelson 1979b, 1980b; Nelson and Nelson 1976, 1977). Because bird feathers provide insulation, contact must typically be made with fleshy parts, such as the skin, feet, or bill. Nelson determined that 60-inch spacing is necessary to accommodate the wrist-to-wrist distance of an eagle. As a result, a 60-inch separation has been widely accepted as the standard foe eagle protection since the 1975 edition of *Suggested Practices*. Although wingspans can measure up to 7.5 feet for golden eagles (*Aquila chrysaetos*) and 8 feet for bald eagles (*Haliaeetus leucocephalus*), the distance between fleshy parts (wrist-to-wrist) is less than 60-inches for both species. Therefore, a 60-inch separation should provide adequate spacing for an eagle to safely perch. Larger birds such as condors or storks may warrant special consideration; however, these species are not typically found in this region. The Bulldog Mine will concentrate on protecting species as large as eagles when designing and constructing powerlines.

Although avian-safe construction minimizes electrocution risk, electrocutions can never be completely eliminated. Because wet feathers and wet wood are conductive, birds can be electrocuted during wet weather on normally benign poles.

With an understanding of how birds can be electrocuted on powerlines, designs can be selected that are avian-safe and help to avoid and/or mitigate electrical hazards to birds. Voltage, conductor separation, and grounding practices are a particular concern when designing avian-safe structures; however, public safety, governed throughout the United States by the current National Electric Safety Code (NESC), and Mine Safety and Health Administration (MSHA) are the primary design considerations.

Site Specific Plans

The NESC and MSHA dictate powerline phase-to-phase separations and the clearances of line components above ground. As such, both the distance between phase conductors and the distance that conductors are hung above ground is based on the line voltage and the activity that does and could take place in the area of the power line. These requirements are considered the minimum distances and separations needed to be certain that the facilities will not be harmful to the general public or the line crews that have to operate and maintain them.

Distribution lines are built with smaller separations between energized conductors and between energized conductors/hardware and grounded line components than are transmission lines. Consequently,

Protective Measures to Help Minimize Electric Powerline Electrocution Hazards to Raptors

avian electrocution risk is greater on distribution lines.

Transmission conductors are generally spaced 3 to 30 feet apart, and are supported on poles or towers that range from 50 to 120 feet in height. Distribution line conductors are generally spaced 2 to 6 feet apart, and are supported on wood, steel, composite or concrete poles that range from 30 to 65 feet in height. As with transmission poles and towers, distribution poles can accommodate more than one circuit. The addition of jumper wires, transformers, switches, and electrical protective devices (fuses, reclosers, and other circuit sectionalizing equipment), as well as grounded hardware included on pole-top assemblies, increase the potential for avian electrocutions due to close separation of energized and grounded parts.

Although it is not realistic to expect to eliminate all hazards to birds, it is feasible to reduce known and potential hazards. At the Bulldog Mine, two basic principles (isolation and insulation) will be utilized to insure avian-safe powerlines to minimize electrocution hazards . The term isolation refers to providing a minimum separation of 60-inches between phase conductors or a phase conductor and grounded hardware/conductor. The isolation principle is the most effective method to minimize electrocution hazards. The term insulation refers to covering phases or grounds where adequate separation is not feasible. Examples of such coverings include, but may not be limited to, phase covers, bushing covers, arrester covers, cutout covers, jumper wire hoses, and covered conductors. In addition, perch discouragers may be used to deter birds from landing on pole locations that are hazardous to birds where isolation, covers, or other insulating techniques cannot be used. Perch discouragers are used to deter perching between closely separated phase conductors. Perch discouragers can be constructed from various materials and designs but most commonly used perch discouragers are triangular shaped objects that are mounted on power pole crossarms between phase conductors. Some equipment poles may necessitate using a combination of techniques to achieve avian safety.

Sunrise Coal is committed to operating safe, environmentally conscious mining operations. This goal can only be achieved by properly designing and constructing our mining operations using the best technology currently available. The measures outlined in this plan intend to protect and minimize electrocution hazards to raptors using the best technology currently available. As such, Sunrise Coal will utilize this plan to insure the best possible protections from electrocution hazards are provided to raptors at the Bulldog Mine.

Protective Measures to Help Minimize Electric Powerline Electrocution Hazards to Raptors

Literature Cited and Bibliography

The majority of information used to prepare this document was obtained from the following publication, *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (CEC-500-2006-022).

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Sunrise Coal, LLC
Bulldog Mine
Permit No. 429

ATTACHMENT V-3B1

SITE SPECIFIC
PRE-MINING ASSESSMENT
ENDANGERED AND THREATENED SPECIES

Site Specific
Pre-Mining Assessment
Endangered and Threatened Species

Sunrise Coal - Bulldog Mine

Permit #429

Vermilion County, IL

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INTRODUCTION

Sunrise Coal, LLC has proposed an underground Room-and-Pillar mine (IDNR OMM #429) mined by 2 continuous miners to extract ~1.2-1.4 million tons of coal per year. The underground mine will be supported by 390.3 acres of surface support area in Vermilion County (T18N, R 14W, Sec 26 and 35), Illinois (Figure 1; pg. 7). The proposed permit area will be impacted by the construction and operation of surface support structures including: a preparation plant, coal stackers, coal stockpiles, soil stockpiles, refuse stockpiles, slurry impoundments, treatment ponds, sediment ponds, and underground mine portals.

This report provides a review of the endangered and threatened species known to occur within Vermilion Counties and the surrounding Illinois Counties and the likelihood that a species occurs within the permit area, pursuant to 62 Ill. Adm. Code 1780.16. This document identifies all habitats, resources, and land uses within the permit area.

METHODS

Aerial photos, soil maps, and geographic information were used to evaluate the habitat within and adjacent to the permit area. Additionally, an on-site investigation was conducted 26 March 2012 to identify and characterize the habitats within the permit area. A list of 76 endangered and threatened species known to occur within Vermilion County and adjacent counties (Iroquois, Ford, Champaign, Douglas, and Edgar) has been compiled to assist in the assessment of the potential biological resources within the proposed permit areas (Table 1, pg. 28-30). The proposed permit area is located in south western Vermilion County.

The habitat requirements of the 76 species listed in Vermilion, Iroquois, Ford, Champaign, Douglas, and Edgar Counties were investigated and described. Each species habitat requirements were compared to the habitats available at the permit areas and a determination was

made concerning the likelihood of occurrence of each species on, and adjacent to, the permit area (Table 2, pg. 31-33; Table 3, pg. 34-35). Distributions and habitats requirements for evaluated species were obtained by referencing the Illinois Endangered Species Protection Boards' "Endangered and Threatened Species of Illinois: Status and Distribution; Vol. 1 – Plants (Herkert and Ebinger, ed. 2002), Vol. 2 – Animals, Vol. 3 – 2004 Plant Changes, and Vol. 4 – 2009 and 2010 Changes". Additional information on distributions and habitat requirements obtained from Illinois Natural History Survey collections database (www.inhs.uiuc.edu/animals_plants/ index.html, Accessed 3/28/2012).

"ADJACENT AREA" DEFINED

As defined in 62 Ill. Adm. Code Section 1701.APPENDIX A, "'adjacent area' means the area located outside the permit area, or shadow area, where a resource or resources, determined according to the context in which adjacent area is used, are or reasonably could be expected to be adversely impacted by proposed mining operations."

Description of Mining Operations

The proposed mining plan for the 390.3 acre permit areas is to construct and operate support structures for a 13,025.5 acre underground mine. Structures constructed within the permit area include a preparation plant, coal stackers, coal stockpiles, soil stockpiles, refuse stockpiles, slurry impoundments, treatment ponds, sediment ponds, and underground mine portals. A railroad loop will be constructed within the permit area to be used in transporting coal off-site. Two continuous miners will operate in a room-and-pillar mine with no planned subsidence.

Impacts of Mining Operations to Water Quality and Quantity

Development of surface facilities will result in soil disturbance and increased sediment yields in surface runoff. Increased sediment and turbidity will only occur within the permitted area since all effluent must pass through an approved sediment basin. Outflow from the sediment basin is required to meet all NPDES requirements. Therefore, effluence from the permit area will not impact the water quality of adjacent aquatic resources.

Within the permit area there are no ephemeral, intermittent, or perennial streams. Small roadside ditches are present along the roads bounding each section. The roadside ditches only drain upland agricultural fields and are vegetated by tall fescue. No affected area runoff from within the surface permit area will report to the roadside ditches prior to discharge from an IDNR/IEPA approved sedimentation basin. A drainage pipe running through the western portion of the permit area drains the agricultural fields within the permit area.

The onsite preparation plant will require a continuous source of water, and to provide this 2 treatment ponds will be constructed upstream of the sedimentation ponds. Water for the preparation plant will be circularly pumped to and from the treatment ponds. Sediment basins will be constructed to control any effluent discharged from the permit area. Excess water in the treatment ponds will drain into the sediment ponds. The sediment basins will result in smaller peak flows during storm events, due to the increased storage and delayed release of storm flow. Due to the water requirements of the preparation plant and the relatively small watershed of the permit area very little water is anticipated to discharge from the permit area.

Impacts of Mining Operations to Noise

Mining operations such as construction, dozer and tractor operation, vehicular traffic, prep plant operation will increase the noise and vibration within the permit area and adjacent areas.

Impacts of Mining to Forested Habitat

The permit area consists entirely of agricultural fields with no forested habitats. A few isolated trees are located adjacent to the agricultural structures within the permit area. No significant impacts are anticipated by the removal of the few isolated trees.

Adjacent Area Defined for Different Groups of Species

Plants

No impacts to plants outside of the permit boundary line are anticipated. Operations within the permit area will not impact adjacent areas. The surrounding area is dominated by agricultural cropland and will not be disturbed by operations within the permit area. A distance of 0 ft is determined to be the adjacent area at which plants may be impacted.

Birds

Birds located adjacent to the permit area may be impacted by increased noise on the mine permit area. Noise can distract and alarm foraging and nesting birds, and even cause nesting birds to abandon their nests. It is difficult to determine the distance at which birds may be impacted by noise.

The National Bald Eagle Management Guidelines have established buffer distances at which Bald Eagles should not be disturbed by mining, off road vehicles, and blasting (USFWS 2007). The buffer distance suggested for mining, off-road vehicles is 660ft. The buffer distances

recommended for blasting activities are ½ mile for areas with no direct line-of-sight to communal roosting sites or nests and 1 mile for areas with a direct line-of-sight to communal roosting sites or nests. Direct line-of-site is determined by whether or not there is an obstruction in view between the eagle and the blasting activity. Preferred obstructions include forested habitats and topographical buffers. Blasting is not proposed within the Bulldog Mine permit area; therefore 660 ft was determined to be the adjacent area at which Bald Eagles may be impacted.

These guidelines were determined to be the best available information and appropriate for other nesting and foraging birds. A distance of 660 ft was used in determining the adjacent area for birds other then bald eagles.

Terrestrial reptiles

Terrestrial reptiles located immediately adjacent to the permit boundary line may be impacted by noise and vibration. However, the habitats adjacent to the permit area are extremely poor for terrestrial reptiles. As a result, adjacent area for terrestrial reptiles is defined as 660 ft from the permit line. Terrestrial reptiles located outside of 660 ft from the permit area boundary would not be expected to be impacted by mining operations.

Aquatic reptiles

Aquatic reptiles located downstream of the permit area could be impacted by mining operations if water quality and/or quantity was expected to be impacted by the proposed mining operations. As discussed above, there are no expected negative impacts to water quality or quantity downstream of the proposed permit area. As a result, it is determined that the mining operations will not impact aquatic reptiles in adjacent areas therefore the adjacent area is considered 0 ft.

Fish

Fish located downstream of the permit area could be impacted by mining operations if water quality and/or quantity was expected to be impacted by the proposed mining operations. As discussed above, there are no expected negative impacts to water quality or quantity downstream of the proposed permit area. As a result, it is determined that the mining operations will not impact fish in adjacent areas therefore the adjacent area is considered 0 ft.

Mammals

Mammals located immediately adjacent to the permit boundary line may be impacted by noise and vibration. However, the habitats adjacent to the permit area are extremely poor for mammals. As a result, adjacent area for mammals is defined as 660 ft from the permit line. Mammals located outside of 660 ft from the permit area boundary would not be expected to be impacted by mining operations.

PROJECT LOCATION

The surface permit area is located within Sections 26 and 35 of Township 18N and Range 14W in Vermilion County (Figure 1; pg. 7). The permit area is located in the southwestern ¼ and the southern ½ of the southeastern ¼ within section 26 and the northeastern ¼ of section 36 excluding a small 6-acre residential tract in the northeast corner of section 36.

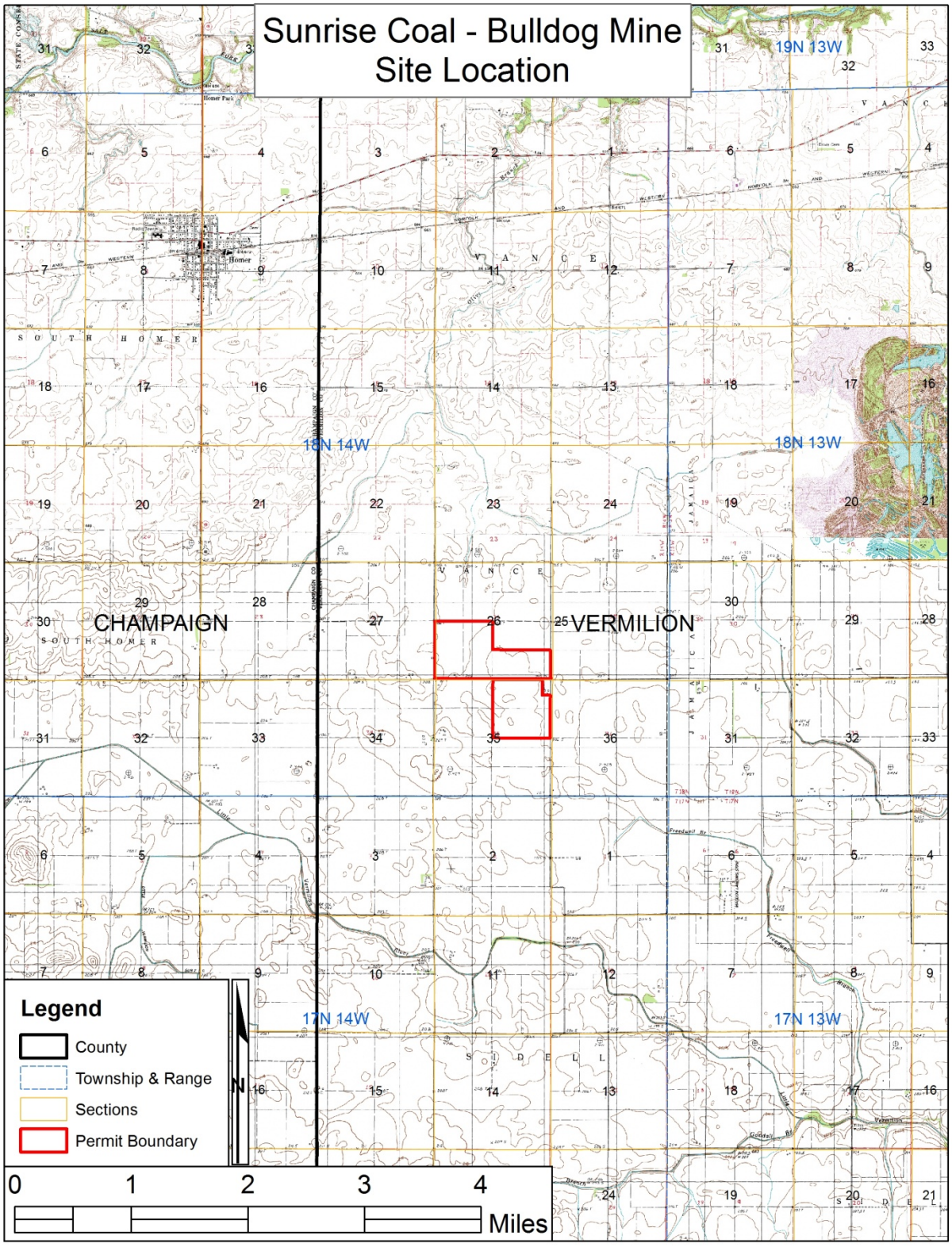

Figure 1. General site location of Bulldog Mine permit area in Section 26 & 36 of Township 18N and Range 14W in Vermilion County, IL.

SITE SPECIFIC RESOURCE INFORMATION

Site Description

The habitat within the permit area is entirely composed of intensive rowcrop agriculture (Figure 2; Pg. 9). The soils of the permit area are predominantly Mollisol "black prairie soils" Drummer and Flanagan silty clay loams.

Forest Habitat

There are no forest habitats within the permit area. A few isolated trees are located near a group of agricultural buildings.

Grassland Habitat

There are no grassland habitats within the permit area. A limited amount of grassy road-side ditches are located along the roads adjacent to the permit area.

Stream and Wetland Habitat

There are no stream or wetland habitats within the permit area. Wetland delineations were conducted throughout the permit area but did not identify any wetland habitats. Additionally, no ephemeral, intermittent, or perennial streams were identified within the permit area. Very small road-side ditches are located along the roads adjacent to the permit area. Additional information can be found in the attached report: "Site Specific Wetland and Stream Resources Pre-mining Assessment." There are no open water habitats within the permit area.

Miscellaneous Habitat

Of the 390.3 acres in the permit area all but 1.3 acres are intensive row-crop agriculture. The remaining 1.3 acres are associated with agricultural buildings and a few isolated trees.

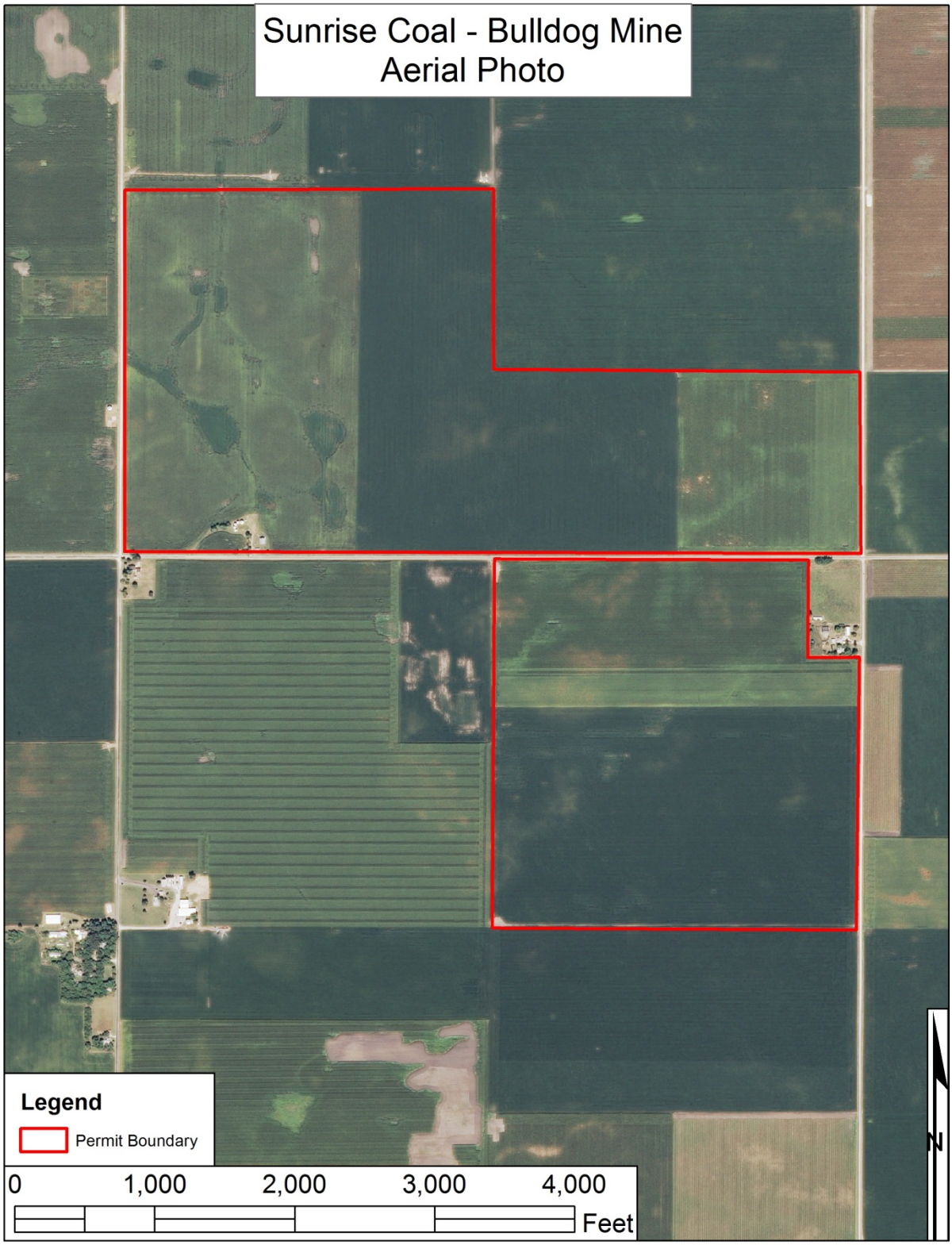

Figure 2. Aerial photo of Bulldog Mine permit area.

SPECIES INVESTIGATIONS

Invertebrates

Swamp Metalmark (Calephelis muticum)

The state endangered Swamp Metalmark is found in wet meadows, marshes, and bogs and requires its host plant, *Cirsium muticum*, to successfully reproduce. In Illinois, the Swamp Metalmark is extremely rare and only known from a few locations. There are no wet meadows or other habitats within the permit area; therefore, it is unlikely for the Swamp Metalmark to occur within the permit area.

Regal Fritillary (Speyeria idalia)

The state threatened Regal Fritillary is found in tallgrass prairies, wet meadows, and other open habitats. There are no tallgrass prairies or other open habitats within the permit area; therefore, it is unlikely for Regal Fritillary to occur on or adjacent to the permit area.

Slippershell (Alasmidonta viridis)

The state threatened Slippershell is found in small to medium sized streams typically in sandy substrates in shallow water. There are no streams within the permit area; therefore it is unlikely for Slippershells to occur on or adjacent to the permit area.

Purple Wartyback (Cyclonaias tuberculata)

The state threatened Purple Wartyback is found in medium to large rivers with a bottom of mixed sand, gravel, or mud typically in areas of flowing current. There are no rivers on or adjacent to the permit area; therefore it is unlikely for Purple Wartybacks to occur on or adjacent to the permit area.

Spike (Elliptio dilatata)

The state threatened Spike is found in small to large stream and lakes in mud or gravel substrates. There are no streams or rivers within the permit area; therefore, it is unlikely for the Spike to occur within the permit area.

Northern Riffleshell (Epioblasma rangiana)

The Northern Riffleshell is a federally endangered mussel that was previously extirpated from Illinois. In 2010, as part of a recovery plan for the Northern Riffleshell and Clubshell, live mussels were translocated into the Middle Fork and North Fork of the Vermilion River. The required habitat for Northern Riffleshells are gravel riffles in medium to large rivers. There are no streams or rivers within the permit area; therefore, it is unlikely that the Northern Riffleshell occurs within the permit area.

Snuffbox (Epioblasma triquetra)

The state endangered Snuffbox is typically found in medium to large rivers in clear, sand and gravel riffles. There are no streams or rivers within the permit area; therefore, it is unlikely that the Snuffbox occurs within the permit area.

Wavy-rayed Lampmussel (Lampsilis fasciola)

The state endangered Wavy-rayed Lampmussel is typically found in coarse sand and gravel bottomed rivers with flowing current. In Illinois, the Wavy-rayed Lampmussel found throughout the Vermilion River and its' forks. There are no rivers or streams within the permit area; therefore, it is unlikely for Wavy-rayed Lampmussels to occur within the permit area.

Black Sandshell (Ligumia recta)

The state threatened Back Sandshell is found in medium to large rivers in riffles and raceways in gravel or firm sand substrates. There are no streams or rivers within the permit area: therefore, it is unlikely that the Black Sandshell occurs within the permit area.

Clubshell (Pleurobema clava)

The federally endangered Clubshell is found in small to medium sized rivers deeply buried in sand and fine gravel bottoms. In 2010, as part of a recovery plan for the Northern Riffleshell and Clubshell, live mussels were translocated into the Middle Fork and North Fork of the Vermilion River. There are no rivers or streams within the permit area; therefore, it is unlikely for the Clubshell to occur within the permit area.

Kidneyshell (Ptychobranchus fasciolaris)

The state endangered Kidneyshell is found in course sand and gravel substrates in flowing currents of small to medium sized rivers and in shallow riffles of larger rivers. There are no streams or rivers within the permit area; therefore, it is unlikely that the Kidneyshell occurs within the permit area.

Rabbitsfoot (Quadrula cylindrica)

The state endangered Rabbitsfoot is found in sand and gravel substrates in flowing current of rivers. In Illinois, the Rabbitsfoot is limited to the North Fork of the Vermilion River. There are no streams or rivers within the permit area; therefore, it is unlikely for the Rabbitsfoot to occur within the permit area.

Salamander Mussel (Simpsonaias ambigua)

The state endangered Salamander Mussel is most commonly on mud or gravel bars under flat stones in areas of swift current. The larval stage of the Salamander Mussel (glochidia) is

dependent upon mudpuppies (Necturus maculosus). There are no streams or rivers within the permit area; therefore, it is unlikely for the Salamander Mussel to occur within the permit area.

Purple Lilliput (Toxolasma lividus)

The state endangered Purple Lilliput is found in sand or fine gravel beds (occasionally in mud) in small streams with shallow running water. In Illinois the Purple Lilliput is rare or uncommon in tributaries of the Wabash and Ohio rivers. There are no streams or rivers within the permit area; therefore, it is unlikely for Purple Lilliputs to occur on or adjacent to the permit area.

Rainbow (Villosa iris)

The state endangered Rainbow inhabits creeks and small to medium rivers in sandy or sand/mud bottom substrates associated with riffles. In Illinois the Rainbow is currently only found in the Vermilion River System. There are no rivers or stream within the permit area; therefore, it unlikely for the Rainbow to occur within the permit area.

Little Spectaclecase (Villosa lienosa)

The state threatened Little Spectaclecase is found in streams and small rivers with a mixed bottom of sand and mud in shallow water. There are no streams or rivers within the permit area; therefore, it is unlikely for Little Spectaclecases to occur within the permit area.

Fish

Eastern Sand Darter (Ammocrypta pellucidum)

The state threatened Eastern Sand Darter is found in sandy runs of small to medium rivers with good water quality and in water deeper than 60 cm. In Illinois the Eastern Sand Darter is known from the Vermilion, Embarras, and Little Wabash River systems. There are no

streams or rivers within the permit area; therefore, it is unlikely for the Eastern Sand Darter to occur within the permit area.

Gravel Chub (Erimystax x-punctatus)

The state threatened Gravel Chub is found in small rivers in deep riffles and channels of moderate to very fast current over substrate of gravel or firm sand-gravel. In Illinois, the Gravel Chub is known from the Rock River system and the Wabash River. There are no stream or rivers within the permit area; therefore, it is unlikely for the Gravel Chub to occur within the permit area.

Bluebreast Darter (Etheostoma camurum)

The state endangered Bluebreast Darter inhabits large, clear streams near large boulders in fast riffles in 10-30 cm deep water. In Illinois, the Bluebreast Darter is known from the Vermilion River system. There are no streams or rivers within the permit area; therefore, it is unlikely for the Bluebreast Darter to occur within the permit area.

Iowa Darter (Etheostoma exile)

The state threatened Iowa darters are found in vegetated lakes, pools of headwaters, and small to medium creeks. In Illinois, the Iowa Darter is known from glacial lakes and a few streams in Northeastern Illinois and Jordan Creek in Vermilion County. There are no streams or rivers within the permit area; therefore, it is unlikely that the Iowa darter occurs on or adjacent to the permit area.

Starhead Topminnow (Fundulus dispar)

The state threatened Starhead Topminnow is found in glacial lakes and clear, well-vegetated floodplain lakes, swamps, and marshes over sand or mud. There are no streams or

rivers within the permit area; therefore, it is unlikely for the Starhead Topminnow to occur within the permit area.

Bigeye Chub (Hybopsis amblops)

The Bigeye Chub is found in flowing rocky pools near riffles and vegetation. Bigeye Chub are highly sensitive to degradation of the stream bottom due to siltation. In Illinois, the Bigeye Chub is known limited records from the Vermilion River, Little Vermilion River, Embarras River, and Little Wabash River. There are no streams or rivers within the permit area; therefore, it is unlikely for the Bigeye Chub to occur within the permit area.

Pallid Shiner (Hybopsis amnis)

The Pallid Shiner is found in medium to large rivers having clear water and a sand-silt substrate. In Illinois the Pallid Shiner is known from the upper reach of the Sangamon River and the lower reach of the Kankakee River. There are not streams or rivers within the permit area; therefore, it is unlikely for the Pallid Shiner to occur within the permit area.

River Redhorse (Moxostoma carinatum)

The state threatened river redhorse is found in deep, swift, gravelly riffles of small to medium rivers. The species is intolerant of silty river bottoms, turbid water, intermittent flow, and pollution. Current records of the river redhorse in Illinois are limited to the upper Illinois river basin and the Vermillion river basin of the Wabash river. There are no rivers on or adjacent to the permit area; therefore, the river redhorse is unlikely to occur on or adjacent to the permit.

River Chub (Nocomis micropogon)

The state endangered River Chub is found in rocky runs and flowing pools of small to medium rivers. In Illinois, the River Chub is known from the Little Vermilion River. There are

no rivers on or adjacent to the permit area; therefore, the River Chub is unlikely to occur on or adjacent to the permit.

Bigeye Shiner (Notropis boops)

The state endangered Bigeye Shiner is found in flowing, clear and rocky, pools of creeks and small to medium rivers. Typically, Bigeye Shiner are most often found in upland streams and creeks. There are no rivers on or adjacent to the permit area; therefore, the Bigeye Shiner is unlikely to occur on or adjacent to the permit area.

Ironcolor Shiner (Notropis chalybaeus)

The state threatened Ironcolor Shiner is found in small, clear, low-gradient streams with a sand/organic matter substrate and an abundance of aquatic macrophytes. In Illinois, the Ironcolor Shiner is known from the Kankakee River and a tributary of the Sangamon River. There are no streams or rivers within the permit area; therefore, the Ironcolor Shiner is unlikely to occur within the permit area.

Blacknose Shiner (Notropis heterolepis)

The state endangered Blacknose Shiner occurs in clear vegetated lakes, and pools and runs of clear streams with sand and mud substrates. In Illinois, the Blacknose Shiner is primarily known from glacial lakes in northern Illinois. There are no streams or rivers within the permit area; therefore, it is unlikely for the Blacknose Shiner to occur within the permit area.

Weed Shiner (Notropis texanus)

The state endangered Weed Shiner inhabits clear sand-bottom creeks with submerged vegetation. In Illinois, the Weed Shiner is known form the Kankakee and Green Rivers. There are no streams of rivers within the permit area; therefore, it is unlikely for the Weed Shiner to occur within the permit area.

Northern Madtom (Noturus stigmosus)

The state endangered Northern Madtom occurs in mixed sand and rock riffles and runs with debris in fast flowing small to large rivers. In Illinois, the Northern Madtom is only known from a few records including a recent record (within 20 years) from the Ohio river and an historical record from the Vermilion river. There are no streams or rivers within the permit area; therefore, it is unlikely for the Northern Madtom to occur within the permit area.

Amphibian

Jefferson Salamander (Ambystoma jeffersonianum)

The state threatened Jefferson Salamander occurs in beech-maple upland deciduous forests where it resides in rodent burrows or under leaf litter, logs, and other surface debris. The known distribution of Jefferson Salamanders is restricted to Edgar and Marshal Counties. There are no deciduous forests within the permit area; therefore, it is unlikely for the Jefferson Salamander to occur within the permit area.

Silvery Salamander (Ambystoma platineum)

The state endangered Silvery Salamander is a unisexual polyploid that requires the presence of small-mouthed salamanders to successfully breed. The Silvery Salamander is only found at a nature preserve in Vermilion County in a wooded upland and adjacent mesic ravine with a vernal pool. There are no woodland or vernal pools within the permit area; therefore, it is unlikely for the Silvery Salamander to occur within the permit area.

Four-toed Salamander (Hemidactylium scutatum)

The state threatened Four-toed Salamander occur in boggy woodland ponds, sphagnum areas adjacent to woodlands, and springfed headwaters of small woodland streams. In Illinois, the Four-toed Salamander is sporadically located in isolated populations. There are moist

woodlands within the permit area; therefore, it is unlikely for the Four-toed Salamander to occur within the permit area.

Mudpuppy (Necturus maculosus)

The state threatened Mudpuppy is found in lakes, ponds, rivers, and large creeks preferably with clear water. In Illinois, the Mudpuppy is known from a scattering of counties throughout the state with the most abundant sites near Lake Michigan. There are streams or rivers within the permit area; therefore it unlikely for the Mudpuppy to occur within the permit area.

Reptile

Kirtland's Snake (Clonophis kirtlandi)

The state threatened Kirtland's Snake is found in wet meadows, open swamp-forests, reservoirs, and occasionally wet, vacant urban areas. In Illinois, the Kirtland's Snake is known from a few locations in East Central Illinois and North Eastern Illinois. There are no wet meadows or other habitats within the permit area; therefore, it is unlikely for the Kirtland's Snake to occur within the permit area.

Blanding's Turtle (Emydoidea blandingii)

The state threatened Blanding's Turtle is found in quiet waters in marshes, prairie wetlands, wet sedge meadows, and shallow, vegetated portions of lakes. In Illinois, the Blanding's Turtle is mostly known from Counties in Northeastern Illinois and previously from prairie marshes throughout northern Illinois prior to their draining. There are no marshes or other wetlands within the permit area; therefore, it is unlikely for the Blanding's Turtle to occur within the permit area.

Western Hog-nosed Snake (Heterodon nasicus)

The state threatened Western Hog-nosed Snake is associated with dry prairies with sandy soils. In Illinois, the Western Hog-nosed Snake is known from remnant prairies in Northwestern and west-central Counties. There are no sandy prairies within the permit area; therefore, it is unlikely for the Western Hog-nosed Snake to occur within the permit area.

Ornate Box Turtle (Terrapene ornate)

The ornate box turtle is found in prairies and grasslands across Illinois (Nyboer et al. 2006). The ornate box turtle prefers grasslands with sandy soils in which it can burrow (Redder et al. 2006). Illinois incorporates the eastern edge of the range for the ornate box turtle. The ornate box turtle is uncommon within Illinois. There are no areas of grassland habitat suitable for ornate box turtles within the permit area. It is unlikely that the ornate box turtle occurs on or adjacent to the permit area.

Bird

Short-eared Owl (Asio flammeus)

The state endangered Short-eared Owl is nests and forages in prairies, meadows, marshes, savanna, and dunes. Specifically, the Short-eared Owl is associated with 30-60 cm tall vegetation. The short-eared owl is one of the world's most widely distributed owls (Wiggins et al. 2006). The owl's range extends across all of North America with breeding populations present in Canada and the northern U.S., and wintering populations present in the southern U.S. and Mexico (Wiggins et al. 2006). There are no grassland or marshy habitats within the permit area; therefore, it is unlikely for the Short-eared Owl to occur within the permit area.

Upland Sandpiper (Bartramia longicauda)

The state endangered Upland Sandpiper is unique among shorebirds in that it is associated with upland pastures, prairies, and hay fields (Houston, Jackson, and Bowen 2011). The Upland Sandpiper is listed as an uncommon migrant and summer resident in Illinois (Nyboer et al. 2006). In Illinois, Upland Sandpipers generally breed in the northern half of the state. Upland Sandpipers require a diverse matrix of grassland habitats to successfully breed; including: short, medium, and tall grasslands created through disturbances such as grazing and prescribed burning. Additionally, Upland Sandpipers typically use large (> 250 acres) grassland habitats located within a landscape dominated by grasslands (Herkert et al. 1993). There are no grassland habitat within or adjacent to the permit area; therefore, it is unlikely for the Upland Sandpiper to occur within the permit area.

Northern Harrier (Circus cyaneus)

The state endangered Northern Harrier's range extends across all of North America with breeding populations present in Canada and the northern U.S., and wintering populations present in the southern U.S., Mexico, and Central America (Macwhirter et al. 1996). Northern harriers utilize open habitats such as grasslands, emergent wetlands, and agricultural areas (Robinson 1997, Macwhirter et al. 1996). There are no grasslands or emergent wetland within the proposed permit area; therefore, it is unlikely for the Northern Harrier to occur within the permit area.

Cerulean Warbler (Dendroica cerulea)

The state threatened Cerulean Warbler is a small, canopy-foraging songbird that breeds in mature and older deciduous forests with heterogeneous canopy structures (Hamel 2000). In Illinois this bird nests in the canopies of large dominant trees in the driest portions of bottomland forests. The Cerulean Warbler is typically considered an area-sensitive species but the strength of

the relationship is unclear. Research from different regions have indicated significantly different results ranging from requirements for forest-tracts >1,600 ha to 20-30 ha large (Hamel 2000). There are no forested habitats within the permit area; therefore, it is unlikely for the Cerulean Warbler to occur within the permit area.

Common Moorhen (Gallinula chloropus)

The state endangered Common Moorhen breeds throughout much of the eastern United States and locally in the west (Bannor et al. 2002). It migrates to winter in southeastern and southwestern states with the largest concentration in Florida. The habitat of the Common Moorhen includes wetlands, such as: marshes, ponds, and ditches, where pools with deep water are interspersed with emergent or shoreline vegetation (Bannor et al. 2002). There are no wetlands within or adjacent to the permit area; therefore, it is unlikely for the Common Moorhen to occur within the permit area.

Least Bittern (Ixobrychus exilis)

The state threatened Least Bittern's breeding populations are distributed across the eastern U.S. and California (Poole et al. 2009). Year round populations are found in Florida and Central America, and wintering populations are found in the Baja Peninsula (Poole et al. 2009). The Least Bittern uses wetland habitat characterized by tall, dense emergent vegetation and clumps of woody plants over deep water (Poole 2009). There are no wetland habitats within or adjacent to the permit area; therefore, it is unlikely for the Least Bittern to occur within the permit area.

Loggerhead Shrike (Lanius ludovicianus)

The state endangered Loggerhead Shrike occupy many types of grassland habitats, but those containing shorter grasses interspersed with small trees and shrubs are generally preferred

(Yosef 1996). Cattle pasture has become some of the most important habitat for loggerhead shrike. There are no grasslands within or adjacent to the permit area; therefore, it is unlikely for the Loggerhead Shrike to occur within the permit area.

Barn Owl (Tyto alba)

The state endangered Barn Owl is one of the most widespread vertebrate species on Earth, occurring on every continent except Antarctica (Marti et al. 2005). Barn owls inhabit open areas, including agricultural fields, grasslands and marshes. Their diet is dominated by voles and other small mammals (Marti et al. 2005). Barn owls nest and roost in a variety of places including hollows or natural cavities in trees, man-made structures, caves, and cliffs. There are no grasslands or forests within or adjacent to the permit; therefore, it is unlikely for the Barn Owl to occur within the permit area.

Mammal

Indiana Bat (Myotis sodalis)

The state and federally endangered Indiana Bat utilizes caves and mines to hibernate during the winter. The Indiana Bat utilizes trees with exfoliating bark or other cavities for roosting during the summer. Typically, Indiana Bats are associated with forested streams and other flyways where they feed 2-30 m above the ground. There are no forested habitats, trees with exfoliating bark, caves, or mines within the permit area. Based on the available habitat within the permit area there are no “Suitable” or “Known” Indiana Bat habitat within the permit area as determined by the “Range-wide Indiana Bat Protection and Enhancement Plan Guidelines” (USFWS 2009). therefore, it is unlikely for the Indiana Bat to occur within the permit area.

Franklin's Ground Squirrel (Spermophilus franklinii)

The state threatened Franklin's Ground Squirrel is associated with remnant prairies and other grassland habitats. In Illinois, the Franklin's Ground Squirrel is found along habitat edges with suitable cover and dry loose soils suitable for burrowing and hibernation during the winter. There are no suitable grassland or shrubland habitats within the permit area; therefore, it is unlikely for the Franklin's Ground Squirrel to occur within the permit area.

Plant

A total of 28 endangered or threatened plant species were identified as occurring within Vermilion, Iroquois, Ford, Champaign, Douglas, and Edgar Counties. This list of plant species was further sorted into the 3 ecological groups: Woodlands and Savannas, Grasslands and Prairies, Wetlands. Each ecological group's general habitat requirements were then compared against the available habitat within the permit area. The ecological groups and the species associated with each are identified in Table 3 – Plant Groups.

Woodlands and Savannas

The 8 species in the "Woodlands and Savannas" ecological group are found in a variety of forest habitats ranging from moist bottomlands to dry upland bluffs. There are no forest habitats within the permit area; therefore, it is unlikely for any of the endangered or threatened "Woodland and Savanna" plants to occur within the permit area.

Grasslands and Prairies

The 14 species in the "Grassland and Prairie" ecological group are found in a variety of remnant prairies, sand prairies, wet prairies, mesic barrens, and other open habitats. There are no grassland habitats within the permit area; therefore, it is unlikely for any of the endangered or threatened "Grassland and Prairies" plants to occur within the permit area.

Wetlands

The 6 species in the "Wetlands" ecological group are found in a variety of wet prairies, bogs, seeps, marshes, and other wetland habitats. There are no wetlands within the permit area; therefore, it is unlikely for any of the endangered or threatened "Wetland" plants to occur within the permit area.

Summary

Out of the 76 endangered or threatened species evaluated to occur within the Bulldog Mine permit area none were determined to be likely to occur within the permit area. The permit area is composed entirely of intensive row-crop agriculture and does not provide any quality wildlife habitat.

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Table 1. Endandgered and Threatened Species in Saline, Williamson, Franklin, Hamilton, Johnson, Pope, White, Gallatin, and Hardin Counties, IL.

#	Scientific Name	Common Name	Group	Status	Vermilion	Champaign	Douglas	Edgar	Ford	Iroquois
1	*Calephelis muticum*	Swamp Metalmark	Invertebrate	Endandgered	X					
2	*Speyeria idalia*	Regal Fritillary	Invertebrate	Threatened						X
3	*Alasmidonta viridis*	Slippershell	Mussel	Threatened	X	X	X		X	
4	*Cyclonaias tuberculata*	Purple Wartyback	Mussel	Threatened	X	X				X
5	*Elliptio dilatata*	Spike	Mussel	Threatened		X	X			X
6	*Epioblasma rangiana*	Northern Riffleshell	Mussel	Endandgered **	X	X				
7	*Epioblasma triquetra*	Snuffbox	Mussel	Endandgered			X			
8	*Lampsilis fasciola*	Wavy-rayed Lampmussel	Mussel	Endandgered	X	X			X	
9	*Ligumia recta*	Black Sandshell	Mussel	Threatened						X
10	*Pleurobema clava*	Clubshell	Mussel	Endandgered **	X					
11	*Ptychobranchus fasciolaris*	Kidneyshell	Mussel	Endandgered	X		X			
12	*Quadrula cylindrica*	Rabbitsfoot	Mussel	Endandgered	X					
13	*Simpsonaias ambigua*	Salamander Mussel	Mussel	Endandgered	X	X				
14	*Toxolasma lividus*	Purple Lilliput	Mussel	Endandgered	X		X			
15	*Villosa iris*	Rainbow	Mussel	Endandgered	X					
16	*Villosa lienosa*	Little Spectaclecase	Mussel	Threatened	X	X	X	X	X	X
17	*Ammocrypta pellucidum*	Eastern Sand Darter	Fish	Threatened	X	X			X	
18	*Erimystax x-punctatus*	Gravel Chub	Fish	Threatened	X					
19	*Etheostoma camurum*	Bluebreast Darter	Fish	Endandgered	X					
20	*Etheostoma exile*	Iowa Darter	Fish	Threatened	X					
21	*Fundulus dispar*	Starhead topminnow	Fish	Threatened						X
22	*Hybopsis amblops*	Bigeye Chub	Fish	Endandgered	X			X		
23	*Hybopsis amnis*	Pallid Shiner	Fish	Endandgered		X				
24	*Moxostoma carinatum*	River Redhorse	Fish	Threatened	X					
25	*Nocomis micropogon*	River Chub	Fish	Endandgered	X					
26	*Notropis boops*	Bigeye Shiner	Fish	Endandgered	X			X		
27	*Notropis chalybaeus*	Ironcolor Shiner	Fish	Threatened						X
28	*Notropis heterolepis*	Blacknose Shiner	Fish	Endandgered						X
29	*Notropis texanus*	Weed Shiner	Fish	Endandgered						X

Table 1. Continued

#	Scientific Name	Common Name	Group	Status	Vermilion	Champaign	Douglas	Edgar	Ford	Iroquois
30	*Noturus stigmosus*	Northern Madtom	Fish	Endandgered	X					
31	*Ambystoma jeffersonianum*	Jefferson Salamander	Amphibian	Threatened				X		
32	*Ambystoma platineum*	Silvery Salamander	Amphibian	Endandgered	X					
33	*Hemidactylium scutatum*	Four-toed Salamander	Amphibian	Threatened	X					
34	*Necturus maculosus*	Mudpuppy	Amphibian	Threatened	X	X		X		
35	*Clonophis kirtlandi*	Kirtland's Snake	Reptile	Threatened			X			
36	*Emydoidea blandingii*	Blanding's Turtle	Reptile	Endandgered	X	X				X
37	*Heterodon nasicus*	Western Hog-nosed Snake	Reptile	Threatened						X
38	*Terrapene ornata*	Ornate Box Turtle	Reptile	Threatened						X
39	*Asio flammeus*	Short-eared Owl	Bird	Endandgered	X					
40	*Bartramia longicauda*	Upland Sandpiper	Bird	Endandgered	X	X			X	
41	*Circus cyaneus*	Northern Harrier	Bird	Endandgered	X	X				
42	*Dendroica cerulea*	Cerulean Warbler	Bird	Threatened				X		
43	*Gallinula chloropus*	Common Moorhen	Bird	Endandgered			X			
44	*Ixobrychus exilis*	Least Bittern	Bird	Threatened	X	X				
45	*Lanius ludovicianus*	Loggerhead Shrike	Bird	Endandgered		X				
46	*Tyto alba*	Barn Owl	Bird	Endandgered		X			X	X
47	*Myotis sodalis*	Indiana Bat	Mammal	Endandgered**	X	X			X	
48	*Spermophilus franklinii*	Franklin's Ground Squirrel	Mammal	Threatened	X	X			X	
49	*Asclepias meadii*	Mead's Milkweed	Plant	Endandgered*	X				X	
50	*Baptisia tinctoria*	Yellow Wild Indigo	Plant	Endandgered						X
51	*Calopogon tuberosus*	Grass Pink Orchid	Plant	Endandgered						X
52	*Carex arkansana*	Arkansas Sedge	Plant	Endandgered			X			
53	*Carex bromoides*	Sedge	Plant	Threatened	X					
54	*Carex communis*	Fibrous-rooted Sedge	Plant	Threatened	X					
55	*Carex cumulata*	Sedge	Plant	Endandgered						X
56	*Carex prasina*	Drooping Sedge	Plant	Threatened	X					
57	*Carex willdenowii*	Willdenow's Sedge	Plant	Threatened	X					
58	*Drosera intermedia*	Narrow-leaved Sundew	Plant	Threatened						X
59	*Filipendula rubra*	Queen-of-the-prairie	Plant	Endandgered	X				X	

Table 1. Continued

#	Scientific Name	Common Name	Group	Status	Vermilion	Champaign	Douglas	Edgar	Ford	Iroquois
60	*Hymenopappus scabiosaeus*	Old Plainsman	Plant	Threatened						X
61	*Hypericum adpressum*	Shore St. John's Wort	Plant	Endandgered						X
62	*Lycopodium dendroideum*	Ground Pine	Plant	Endandgered						X
63	*Phlox pilosa ssp. sangamonensis*	Sangamon Phlox	Plant	Endandgered		X				
64	*Platanthera clavellata*	Wood Orchid	Plant	Endandgered						X
65	*Platanthera flava var. herbiola*	Tubercled Orchid	Plant	Threatened						X
66	*Platanthera leucophaea*	Eastern Prairie Fringed Orchid	Plant	Endandgered*						X
67	*Poa wolfii*	Wolf's Bluegrass	Plant	Endandgered	X					
68	*Polygala incarnata*	Pink Milkwort	Plant	Endandgered						X
69	*Polygonum careyi*	Carey's Heartsease	Plant	Endandgered						X
70	*Rubus schneideri*	Bristly Blackberry	Plant	Threatened						X
71	*Silene regia*	Royal Catchfly	Plant	Endandgered	X					
72	*Sisyrinchium atlanticum*	Eastern Blue-eyed Grass	Plant	Threatened						X
73	*Tomanthera auriculata*	Ear-leafed Foxglove	Plant	Threatened		X				X
74	*Valerianella umbilicata*	Corn Salad	Plant	Endandgered						X
75	*Veronica scutellata*	Marsh Speedwell	Plant	Threatened						X
76	*Viola primulifolia*	Primrose Violet	Plant	Endandgered						X

* Federally Threatened

** Federally Endangered

Table 2. Habitat requirements and Probability of Occurrence of Illinois threatened and endangered animals at the Bulldog Mine permit area.

Species Name	Common Name	Habitat Type	Probability of Occurrence
		Invertebrate	
Calephelis muticum	Swamp Metalmark	Wet Meadows, Marshes, and Bogs	Not Likely
Speyeria idalia	Regal Fritillary	Tallgrass Prairie, Wet Meadows, Open Habitats	Not Likely
		Mussel	
Alasmidonta viridis	Slippershell	Small to Medium Streams	Not Likely
Cyclonaias tuberculata	Purple Wartyback	Medium to Large Rivers	Not Likely
Elliptio dilatata	Spike	Large Streams and Lakes	Not Likely
Epioblasma rangiana	Northern Riffleshell	Medium to Large Rivers	Not Likely
Epioblasma triquetra	Snuffbox	Medium to Large Rivers	Not Likely
Lampsilis fasciola	Wavy-rayed Lampmussel	Sandy and Gravel Bottomed Rivers	Not Likely
Ligumia recta	Black Sandshell	Medium to Large Rivers	Not Likely
Pleurobema clava	Clubshell	Small to Medium Rivers	Not Likely
Ptychobranchus fasciolaris	Kidneyshell	Small to Medium Rivers	Not Likely
Quadrula cylindrica	Rabbitsfoot	Sandy and Gravel Bottomed Rivers	Not Likely
Simpsonaias ambigua	Salamander Mussel	Mud or Gravel Bars under Flat Stones in Swift Current	Not Likely
Toxolasma lividus	Purple Lilliput	Sand or Fine Gravel in Small Streams	Not Likely
Villosa iris	Rainbow	Small to Medium Rivers	Not Likely
Villosa lienosa	Little Spectaclecase	Streams and Small Rivers	Not Likely
		Fish	
Ammocrypta pellucidum	Eastern Sand Darter	Sandy Runs of Small to Medium Rivers	Not Likely
Erimystax x-punctatus	Gravel Chub	Deep Riffles and Channels of Small Rivers	Not Likely
Etheostoma camurum	Bluebreast Darter	Near Large Boulders in Large Clear Streams	Not Likely

Table 2. Continued

Species Name	Common Name	Habitat Type	Probability of Occurrence
Etheostoma exile	Iowa Darter	Vegetated Lakes, Small and Medium Creeks	Not Likely
Fundulus dispar	Starhead topminnow	Glacial Lakes, Swamps, Marshes	Not Likely
Hybopsis amblops	Bigeye Chub	Rocky Pools near Riffles and Vegetation	Not Likely
Hybopsis amnis	Pallid Shiner	Medium to Large Rivers	Not Likely
Moxostoma carinatum	River Redhorse	Small to Medium Rivers	Not Likely
Nocomis micropogon	River Chub	Small to Medium Rivers	Not Likely
Notropis boops	Bigeye Shiner	Creeks, Small to Medium Rivers	Not Likely
Notropis chalybaeus	Ironcolor Shiner	Small, Clear, Low-Gradient Streams	Not Likely
Notropis heterolepis	Blacknose Shiner	Clear, Vegetated Lakes, Pools and Runs of Streams	Not Likely
Notropis texanus	Weed Shiner	Clear Sand-Bottom Creeks	Not Likely
Noturus stigmosus	Northern Madtom	Sand and Rock Riffles and Runs	Not Likely
		Amphibian	
Ambystoma jeffersonianum	Jefferson Salamander	Beech-Maple Upland Deciduous Forests	Not Likely
Ambystoma platineum	Silvery Salamander	Wooded Upland and Mesic Ravine in Vermilion County	Not Likely
Hemidactylium scutatum	Four-toed Salamander	Boggy Woodland Ponds	Not Likely
Necturus maculosus	Mudpuppy	Lakes, Ponds, Rivers, and Large Creeks	Not Likely
		Reptile	
Clonophis kirtlandi	Kirtland's Snake	Wet Meadows, Open Swamp-Forests, Reservoirs	Not Likely
Emydoidea blandingii	Blanding's Turtle	Marshes, Prairie Wetlands, Sedge Meadows, Lakes	Not Likely
Heterodon nasicus	Western Hog-nosed Snake	Dry-Prairies with Sandy Soils	Not Likely
Terrapene ornata	Ornate Box Turtle	Grasslands with Sandy Soils	Not Likely

Table 2. Continued

Species Name	Common Name	Habitat Type	Probability of Occurrence
		Bird	
Asio flammeus	Short-eared Owl	Prairies, Meadows, Marshes, Savanna, and Dunes	Not Likely
Bartramia longicauda	Upland Sandpiper	Upland Pastures, Prairies, and Hay Fields	Not Likely
Circus cyaneus	Northern Harrier	Grasslands, Emergent Wetlands, Agricultural Areas	Not Likely
Dendroica cerulea	Cerulean Warbler	Mature and Older Deciduous Forests	Not Likely
Gallinula chloropus	Common Moorhen	Marshes, Ponds, and Ditches with Interspersed Vegetation	Not Likely
Ixobrychus exilis	Least Bittern	Tall, Dense Emergent Vegetation over Deep Water	Not Likely
Lanius ludovicianus	Loggerhead Shrike	Grasslands with Shorter Grasses with Small Trees	Not Likely
Tyto alba	Barn Owl	Open Habitats: Agricultural Fields, Grasslands, and Marshes	Not Likely
		Mammal	
Myotis sodalis	Indiana Bat	Caves and Mines, Trees with Exfoliating Bark	Not Likely
Spermophilus franklinii	Franklin's Ground Squirrel	Remnant Prairies and other Grassland Habitats	Not Likely

Table 3. Habitat requirements and Probability of Occurrence of Illinois threatened and endangered plants at the Bulldog Mine permit area.

Species Name	Common Name	Habitat Type	Probability of Occurrence
		Woodlands and Savannas	
Baptisia tinctoria	Yellow Wild Indigo	Open Woodlands and Savannas with dry, sterile soils	Not Likely
Carex arkansana	Arkansas Sedge	Moist Flatwoods	Not Likely
Carex bromoides	Sedge	Wet Woods, Swamps, and Bogs	Not Likely
Carex communis	Fibrous-rooted Sedge	Open Rocky Woods	Not Likely
Carex prasina	Drooping Sedge	Forested Seeps and Sandstone Undercuts	Not Likely
Carex willdenowii	Willdenow's Sedge	Dry to mesic upland Forest	Not Likely
Lycopodium dendroideum	Ground Pine	Mesic Sand Forest, Sand Prairie, and Forested Ravines	Not Likely
Poa wolfii	Wolf's Bluegrass	Woodland	
		Prairie	
Asclepias meadii	Mead's Milkweed	Remnant Prairies, Barrens, Railroad Prairies	Not Likely
Carex cumulata	Sedge	Disturbed Fields, Open Savannas, Sand Prairies	Not Likely
Hymenopappus scabiosaeus	Old Plainsman	Sand Prairies and Open Sand Forests	Not Likely
Phlox pilosa ssp. sangamonensis	Sangamon Phlox	Forest Openings, Blufftops, and Prairies along the Sangomon River	Not Likely
Platanthera clavellata	Wood Orchid	Mesic Sand Prairies and Thickets	Not Likely
Platanthera leucophaea	Eastern Prairie Fringed Orchid	Mesic to Wet Prairies	Not Likely
Polygala incarnata	Pink Milkwort	Sand Prairies, Hill Prairies, and Barrens	Not Likely
Polygonum careyi	Carey's Heartsease	Sand Prairies	Not Likely
Rubus schneideri	Bristly Blackberry	Wet, Mestic Sand Prairies	Not Likely
Silene regia	Royal Catchfly	Dry-Messic Barrens and Prairies	Not Likely
Sisyrinchium atlanticum	Eastern Blue-eyed Grass	Mesic Prairie Habitat	Not Likely

Table 3. Continued

Species Name	Common Name	Habitat Type	Probability of Occurrence
Tomanthera auriculata	Ear-leafed Foxglove	Prairies and Savannas	Not Likely
Valerianella umbilicata	Corn Salad	Mesic to Dry Dolomite and Sandstone Bluffs, Low Ground, Sandy Slopes	Not Likely
Viola primulifolia	Primrose Violet	Wet-Mesic Sand Prairies	Not Likely
		Wetlands	
Calopogon tuberosus	Grass Pink Orchid	Wet Prairies , Bogs, and Fens	Not Likely
Drosera intermedia	Narrow-leaved Sundew	Peat Bogs and Wet Sand Prairies	Not Likely
Filipendula rubra	Queen-of-the-prairie	Fens, Mesic Sand Prairies, and Seeps	Not Likely
Hypericum adpressum	Shore St. John's Wort	Sandy Damp Peaty Areas	Not Likely
Platanthera flava var. herbiola	Tubercled Orchid	Wet-mesic sand prairies	Not Likely
Veronica scutellata	Marsh Speedwell	Marshes, Graminoid Fens, Wetlands	Not Likely

Sunrise Coal, LLC
Bulldog Mine
Permit No. 429

ATTACHMENT V-3B3

SITE SPECIFIC
WETLAND AND STREAM RESOURCES
PRE-MINING ASSESSMENT

Site Specific
Wetland and Stream Resources
Pre-Mining Assessment

Sunrise Coal - Bulldog Mine

Permit # 429

Vermilion County, IL

Prepared by

Shawn Duncan, M.S.

Midwest Reclamation Resources

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INTRODUCTION

Sunrise Coal, LLC has proposed an underground Room-and-Pillar mine (IDNR OMM #429) mined by 2 continuous miners to extract ~1.2-1.4 million tons of coal per year. The underground mine will be supported by 390.3 acres of surface support area in Vermilion County (T18N, R 14W, Sec 26 and 35), Illinois (Figure 1; pg. 4). The proposed permit area will be impacted by the construction and operation of surface support structures including: a preparation plant, coal stackers, coal stockpiles, soil stockpiles, refuse stockpiles, slurry impoundments, treatment ponds, sediment ponds, and underground mine portals. This report provides a review of the wetland and stream resources known to occur within the permit area.

METHODS

Wetlands were identified according to the criteria listed in "Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region". Wetland determinations were made based on the presence of hydrophytic vegetation, hydric soil, and wetland hydrology identified during site investigations. National Wetlands Inventory (NWI) data (Figure 2, pg. 5), USGS National Hydrography Dataset (NHD) (Figure 3, pg. 6), and National Resources Conservation Service (NRCS) soil maps (Figure 4, pg. 7) were used to help identify wetlands in addition to observations taken in the field. Wetland area delineations were determined through on-site inspections, GPS, and 2011 NRCS national USDA imagery. Wetland determination data forms can be found in Appendix A.

Site inspections were conducted on March 26, 2012. Baselines and transects were utilized to locate sample locations for wetland delineations (Figure 4, pg. 7). In the previous month there were 1.39 inches of precipitation including 0.23 inches of precipitation 3-days prior to the on-site

inspection. This report identifies potential wetlands based on my expert opinion; however, final jurisdictional determination is contingent upon the U. S. Army Corps of Engineers (ACOE).

RESULTS

A NRCS soils report was reviewed to assist in wetland determinations (Figure 4, Page 7; Table 1). Two hydric soil-types occur within the proposed permit area: a Drummer silty clay loam, 0-2% slopes (152A); and a Harpster silty clay loam, 0-2% slopes (67A). The Drummer silty clay loam soil type consists of very deep poorly drained soils formed in loess or other silty material on nearly level or depressional areas. The Harpster silty clay loam soil type consists of very deep poorly drained soils formed in calcareous loess or glacial drift on nearly level or depressional areas. The most prominent soil types within the permit area are the Drummer silty clay loam and the Flanagan silt loam. The permit area is drained by road-side ditches and buried drainage tiles. The overall topography of the land is flat draining to the north into the Salt Fork of the Vermilion River.

Table 1. Soil types within the Bulldog Mine permit area.

Soil Mapping Unit	Soil Name	Hydric Rating	Acres
56B2	Dana silt loam, 2-5% slopes, eroded	Not Hydric	11.1
67A	Harpster silty clay loam, 0-2% slopes	Hydric	5.2
152A	Drummer silty clay loam, 0-2% slopes	Hydric	214.9
154A	Flanagan silt loam, 0-2% slopes	Not Hydric	157.3
171B	Catlin slit loam, 2-5% slopes	Not Hydric	1.8
			390.3

The NWI on-line wetlands mapper database was accessed to identify existing wetlands within the permit area (Figure 3, Page 6). Using infrared satellite imagery from the 1980's the NWI did not identify any wetlands. Based upon on-site inspections and wetland delineations there are no wetlands of any type within the permit area. The permit area is completely cultivated

and farmed and possesses no wetland plants. Even though a large portion of the permit area is made up of Drummer silty clay loam (a hydric soil), the soils have improved drainage as a result of roadside ditches and underground drainage systems and do not exhibit any hydric soil indicators. The hydrology of the site has been altered resulting in the water table being lowered to a level that the upper 12 inches of soil are not saturated.

There are no streams within the permit area. Along the rural roads that bound the sections in area are shallow grassy ditches that collect drainage from the flat topography. An underground pipe collects drainage from the area and transports it north eventually into the Olive Branch, a tributary of the Salt Fork.

SUMMARY

There are no wetlands, streams, or other water bodies within the Bulldog Mine permit area. There are no jurisdictional waters of the U.S. within the Bulldog Mine permit area.

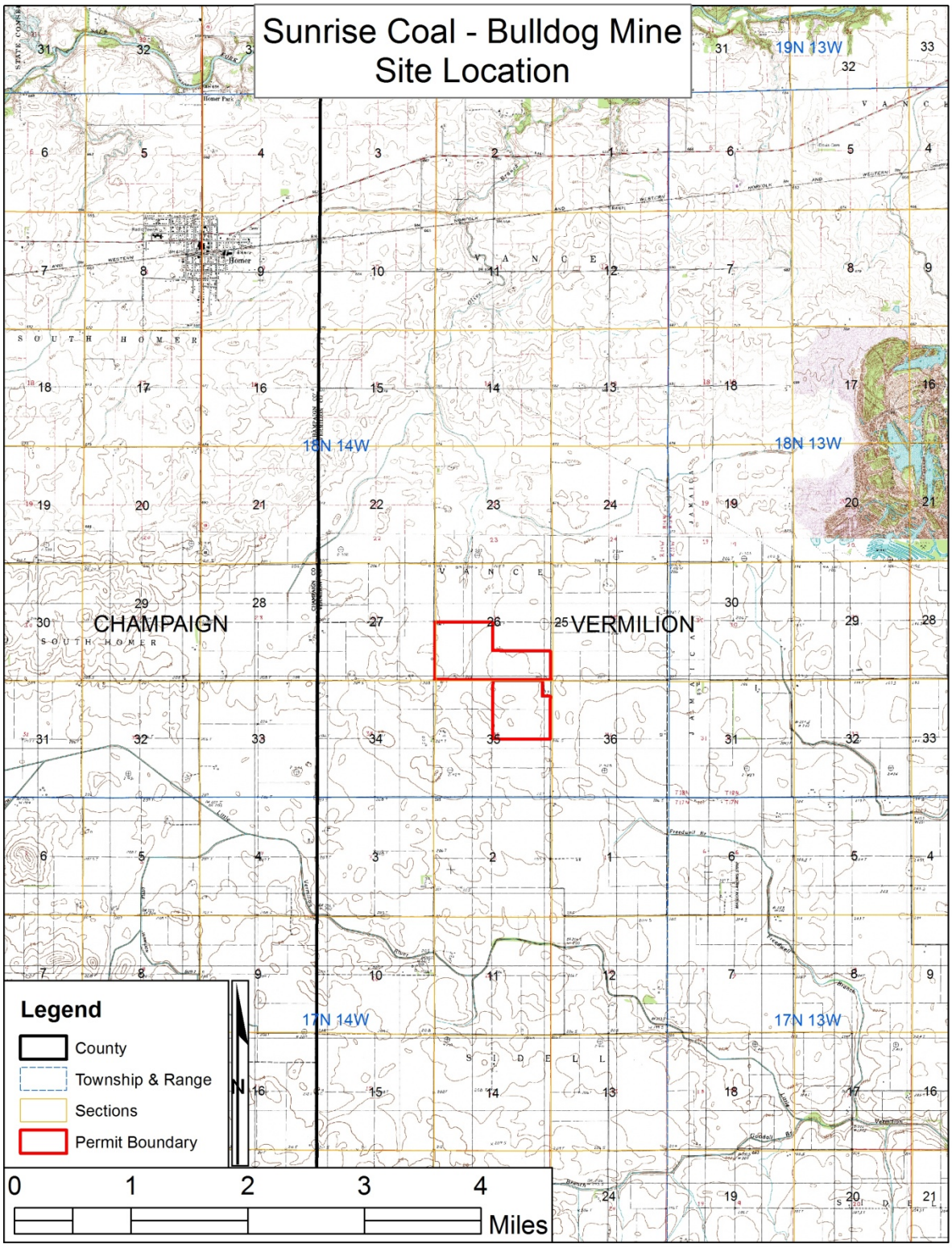

Figure 1. General site location of Bulldog Mine permit area in Section 26 & 36 of Township 18N and Range 14W in Vermilion County, IL.

Figure 2. NWI wetlands identified near the Bulldog Mine permit area.

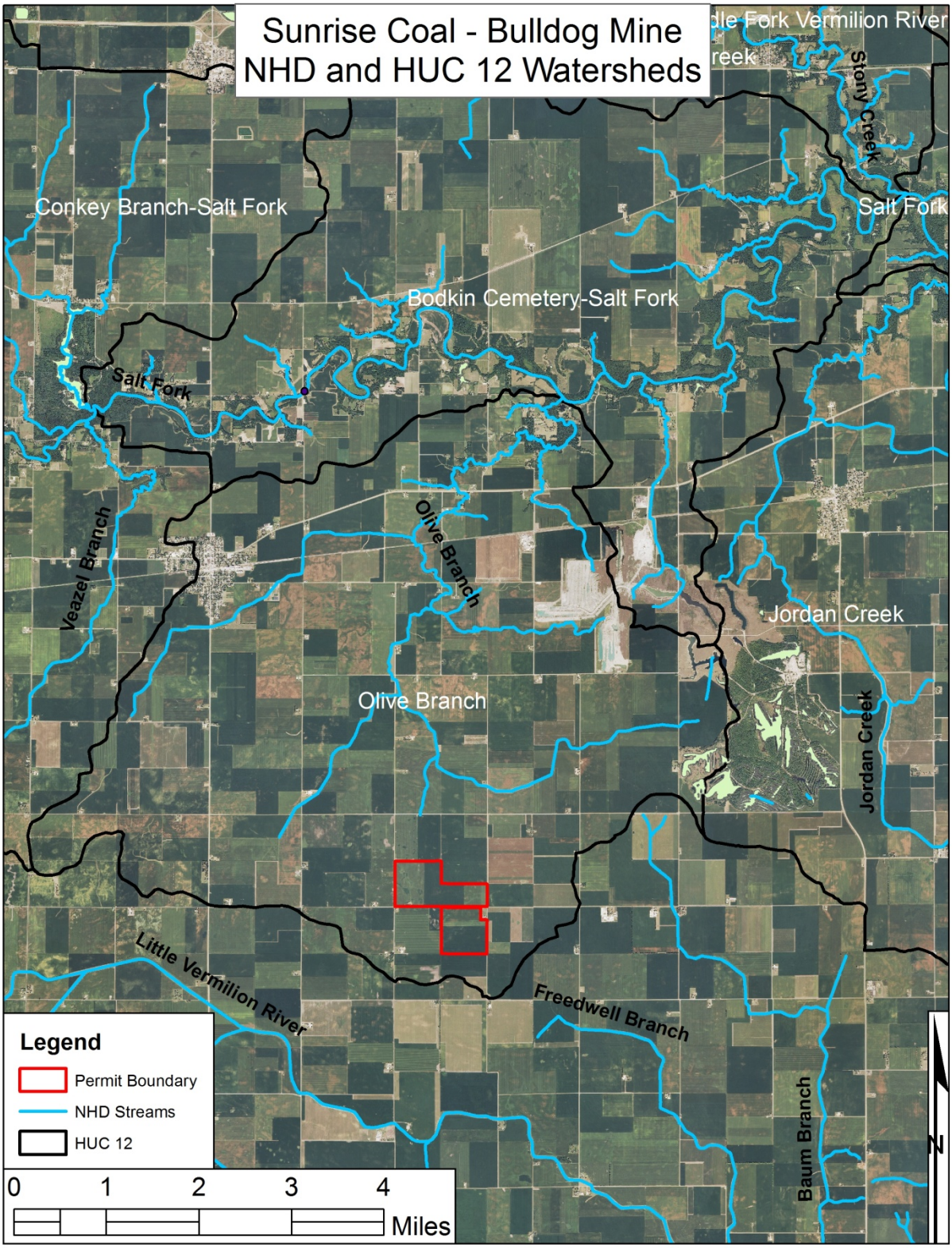

Figure 3. NHD streams and 12-digit HUC Watersheds near the Bulldog Mine permit area.

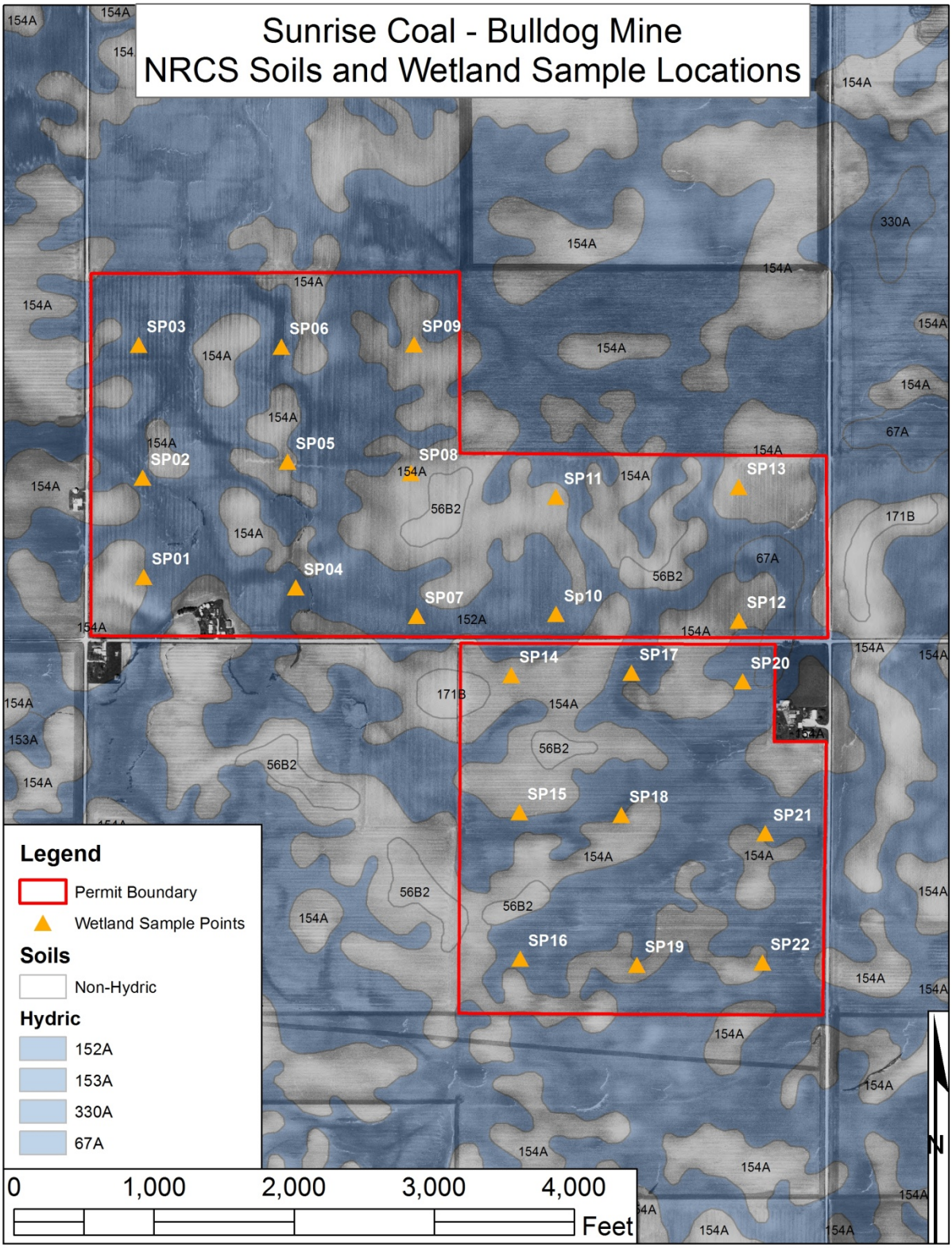

Figure 4. NRCS soils and locations of Wetland Sample points in the Bulldog Mine permit area.

PHOTOS

Photo 1. Photo of Bulldog Mine permit area.

Photo 2. Road-side ditches adjacent to the Bulldog Mine permit area.

APPENDIX A

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 01

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 59.316"N Long: 87° 55' 6.048"W Datum: NAD 83

Soil Map Unit Name: Flanagan Silt Loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean stubble	70		NA
2. Bare Ground	30		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybean Stubble

SOIL

Bulldog Mine

Sampling Point: SP 01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					silty clay loam	Black Prairie Soil
12-14	10YR 2/2	95					silty clay loam	
12-14	10YR 3/2	5					silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 02

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 6.416"N Long: 87° 55' 6.311"W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	65		NA
2. Bare Ground	35		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag field - Soybean Stubble

SOIL

Bulldog Mine

Sampling Point: SP 02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Silty Clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 15.729"N Long: 87° 55' 6.796"W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	75		NA
2. Bare Ground	25		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag field - Soybean Stubble

SOIL

Bulldog Mine

Sampling Point: SP 03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silty Clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 04

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 58.659" N Long: 87° 54' 52.103" W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1. Bare Ground	100		
2.			
3.			
4.			
5.			
	100 = Total Cover		
Herb Stratum (Plot size: NA)			
1. Bare Ground	100		
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field

SOIL Bulldog Mine Sampling Point: SP 04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100						
12-15	10YR 3/2	70						
12-15	10YR 5/2	30						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 05

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 7.567" N Long: 87° 54' 52.903"W Datum: NAD 83

Soil Map Unit Name: Flanagan silt loam: 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean stubble	50		NA
2. Bare Ground	50		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag field - Soybean

SOIL

Bulldog Mine

Sampling Point: SP 05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					silty clay loam	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 06

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 15.775" N Long: 87° 54' 53.619"W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	50		
2. Bare Ground	50		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field- soybeans

SOIL

Bulldog Mine

Sampling Point: SP 06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 07

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 56.794" N Long: 87° 54' 41.135"W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean stubble	80		NA
2. Bare Ground	20		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - soybeans

SOIL

Bulldog Mine

Sampling Point: SP 07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 08

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 6.943" N Long: 87° 54' 41.521" W Datum: NAD 83

Soil Map Unit Name: Flanagan silt loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	80		
2. Bare Ground	20		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field- Soybeans

SOIL Bulldog Mine Sampling Point: SP 08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100						Black Prairie Soil
12-14	10YR 2/2	90						
12-14	10YR 3/2	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
Water Table Present? Yes _____ No X Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 09

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 15.953" N Long: 87° 54' 41.585" W Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam: 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	75		
2. Bare Ground	25		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					Silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 10

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 57.093"N Long: 89° 54' 28.115" W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean stubble	70		NA
2. Bare Ground	25		NA
3. Barbarea vulgaris arcuata	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 11

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 5.244"N Long: 87° 54' 28.279"W Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam: 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble			
2. Bare Ground			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					silty clay	Black Prairie Soil
12-14	10YR 2/2	80						
12-14	10YR 3/2	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 12

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 56.709"N Long: 87° 54' 11.376"W Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	70		
2. Bare Ground	30		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					silty clay	Black Prairie Soil
12-14	10YR3/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 13

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 59' 6.105" N Long: 87° 54' 11.5" W Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean stubble	70		NA
2. Bare Ground	30		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 14

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 52.727"N Long: 87° 54' 32.24" W Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Bare soil	80		
2. Corn Stubble	20		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Corn Stubble

SOIL Bulldog Mine Sampling Point: SP 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					Silty Clay	Black Prairie Soil
12-14	10YR 2/2	95						
12-14	10YR 3/2	5						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
Water Table Present? Yes _____ No X Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 15

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 43.08" N Long: 87° 54' 31.332"W Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean stubble	70		
2. Bare Ground	30		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybean stubble

SOIL

Bulldog Mine

Sampling Point: SP 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10Yr 2/2	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 16

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 32.611" N Long: 87° 54' 31.193" W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Soybean Stubble	85		NA
2. Bare Ground	15		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100						Black Prairie Soil
12-15	10YR 3/2	5						
12-15	10YR 2/1	95						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 17

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 52.9" N Long: 87° 54' 52.143"W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?**	Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑		
Wetland Hydrology Present?	Yes ☐	No ☑		

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10')			
1. Corn Stubble	40		NA
2. Bare Ground	60		NA
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Corn field

SOIL

Bulldog Mine

Sampling Point: SP 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 18

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 42.814"N Long: 87° 54' 22.074"W Datum: NAD 83

Soil Map Unit Name: Drummer/Flanagan silty clay loam; 154A/152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Corn stubble	80		
2. Bare Ground	20		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Corn

SOIL

Bulldog Mine

Sampling Point: SP 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	90					silty clay	black Prairie Soil
0-12	10YR 3/1	10						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 19

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 32.377" N Long: 87° 54' 20.464" W Datum: NAD 83

Soil Map Unit Name: FInagan silty clay loam;154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Bare Ground	95		
2. Soybean Stubble	5		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag field - Soybeans

SOIL

Bulldog Mine

Sampling Point: SP 19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	80					silty clay	Black Prairie Soil
0-12	10YR 3/2	20						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 20

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 52.48"N Long: 87° 54' 11.024"W Datum: NAD 83

Soil Map Unit Name: Drummer silty clay loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Corn Stubble	60		
2. Bare soil	40		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Corn

SOIL

Bulldog Mine

Sampling Point: SP 20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - drained, no hydric indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 21

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 58' 41.684"N Long: 87° 54' 8.807"W Datum: NAD 83

Soil Map Unit Name: Drummer silty loam; 152A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Corn Stubble	90		
2. Bare Soil	10		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Corn

SOIL

Bulldog Mine

Sampling Point: SP 21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained, no hydric indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Bulldog Mine City/County: Vermilion County Sampling Date: 3/26/2012

Applicant/Owner: Sunrise Coal LLC. State: IL Sampling Point: SP 22

Investigator(s): Shawn Duncan Section, Township, Range: Sections 26 & 35, T 18N, R 14W

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 39° 54' 8.813" W Long: 39° 58' 32.478"N Datum: NAD 83

Soil Map Unit Name: Flanagan silty clay loam; 154A NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:

Farmed black prairie soils (Mollic epipedon). Historically drained ca. 1920's. Hydrophytic vegetation not present, hydric soil indicators not present, and wetland hydrology not present.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10')			
1. Corn Stubble	90		
2. Bare Ground	10		
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: NA (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = NA

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Ag Field - Corn

SOIL

Bulldog Mine

Sampling Point: SP 22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					silty clay	Black Prairie Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Mollisol - Drained

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology not observed. Historic tiling and draining has lowered the average water table below 12". Observed water table was ca. 4 ft. below surface (as observed through existing bore hole pit).