



**Cumulative Environmental  
Assessment**

**Hummingbird Energy LLC**

**Hummingbird Solar Project**

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## Abbreviations

BMPs	Best Management Practices
Hummingbird Solar	Hummingbird Energy, LLC
CEA	Cumulative Environmental Assessment
CFC	Chlorofluorocarbons
CO	Carbon monoxide
KAR	Kentucky Administrative Regulations
KDOW	Kentucky Division of Water
KRS	Kentucky Revised Statutes
NAAQS	National Ambient Air Quality Standards
NO <sub>x</sub>	Nitrous oxides
PM	Particulate Matter
PPE	Personal Protective Equipment
Project	Hummingbird Solar Project
SO <sub>2</sub>	Sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound

## 1.0 INTRODUCTION

The purpose of this report is to satisfy the requirements of the Kentucky Revised Statutes (KRS) 224.10-280 which states no person shall commence to construct a facility to be used for the generation of electricity unless that person submits a cumulative environmental assessment (CEA) to the Kentucky Energy and Environment Cabinet with the permit application. Hummingbird Energy LLC (Hummingbird) has prepared this report to satisfy the requirements of KRS 224.10-280 as part of their application for the Hummingbird Solar Project (Project). The Project is a proposed 200 MW solar facility that is situated on a Project area of 2,106 (fenced) acres and will generate electricity with photovoltaic solar panels. The Project is located near Mt Carmel, in Fleming County, Kentucky (GPS Centroid 38.280343°, -83.38388°). The proposed Project Site and surrounding parcels are rural, agricultural used, and scattered residential development.

Upon researching the statute and accompanying regulations, Hummingbird is unaware of any regulations that have been promulgated regarding CEAs. To comply with KRS 224.10-280, this cumulative environmental assessment will evaluate potential project impacts to four areas: Air Pollutants, Water Pollutants, Wastes and Water Withdrawal.

## 2.0 AIR POLLUTANTS

The emission of air pollutants is regulated through the Clean Air Act, which through its regulations has established baseline National Ambient Air Quality Standards (NAAQS) for multiple pollutants in order to protect public health and welfare. The pollutants covered are ozone, particulate matter (PM), carbon monoxide (CO), nitrous oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and lead.

Geographic areas with ambient concentrations of these pollutants that exceed the NAAQS are designated as areas of nonattainment, and new emissions sources in or near these areas are often subjected to more stringent permitting requirements.

Fleming and Mason counties and all surrounding counties (Bracken, Robertson, Nicholas, Bath, Lewis, and Rowan) are all in attainment for all pollutants (USEPA, 2022). Additionally, Fleming County is protected by the Air Quality Regulations found in the Kentucky Administrative Regulations (KAR), Title 401 Chapters 50-68.

Increases in air pollutant emissions would occur during development and construction of the facility; however, these increases would be temporary in nature. Air pollutant emissions would result from operation and staging of supplies and construction equipment, worker personnel vehicles, and equipment and supply deliveries. The amount of increase in air pollutant emissions would vary by the construction activity, work force size, and weather conditions occurring on the site. It is estimated that up to 300 workers would be onsite at any one time during the up to 12-month construction period. When possible, work will be conducted during daylight hours, but at times it may be necessary to continue work after dark to complete critical construction activities. Construction and operation equipment would include, but not be limited to, bulldozers, backhoes, flatbed semi-trucks, cranes, forklifts, bobcats and/or specialized tractors with extender or drill with auger or pile driver for installation of solar panel array posts, and concrete trucks.



Local emissions of PM, NO<sub>x</sub>, CO, volatile organic compounds (VOCs), and SO<sub>2</sub> would be generated by both gasoline and diesel combustion engines. These emissions are anticipated to result in minor air quality impacts due to the limited durations, numbers of vehicles, and hours of operation. Tree clearing and associated actions are expected to be limited due to the site being primarily sited within agricultural land. No burning of woody debris will occur on site, and trees that are felled will be managed at an offsite facility or will be chipped or mulched on site.

Activities related to construction at the site will result in temporary increases in air pollutant emissions (e.g., dust and other suspended particles). Any grading and vehicle travel on unpaved roads will result in an increased dust emission. To reduce impacts to air quality, the Project will require contractors to implement best management practices (BMPs) such as wetting areas to reduce dust and covering loads to minimize dust emissions. Overall, impacts on air quality will be minor due to being localized and temporary in nature.

Solar facilities do not produce any emissions during operation, as such, the Project is not anticipated to emit any of the criteria pollutants (PM, CO, SO<sub>2</sub>, NO<sub>x</sub>, VOCs, or lead). In addition, no hazardous air pollutants are expected to be emitted from the facility during operation.

During operation the only anticipated emissions associated with the facility are those from maintenance vehicles, such as trucks used by technicians and equipment used during mowing and other vegetation control. Hummingbird anticipates limited visits by personnel to the site to conduct inspections, perform equipment maintenance, and vegetation management.

## **3.0 WATER QUALITY**

### **3.1 SURFACE WATER**

The Project is located within the Fleming Creek, Turkey Run, and Farrows Creek watersheds. There are 16 streams and 54 ponded areas within the project area. 14 streams potentially possess a significant nexus to the Licking River (USGS, 2022). The Project is predominantly comprised of agricultural lands interspersed with residential development, rural, and forested areas. As such, the majority of vegetation consists of planted agricultural species, and the natural hydrology has been significantly altered. None of the waterways in or immediately adjacent to the Project have any special designation (e.g., Outstanding State Resource Waters, Coldwater Aquatic Habitats, or other Special Use Waters) from the Kentucky Division of Water (KDOW, 2022).

Construction activities may increase erosion and sedimentation impacting onsite streams and wetlands. To minimize impacts, the Project will utilize the existing landscape where possible to eliminate grading. Where grading is unavoidable, it will be completed with earthmoving machinery and will make every effort to match existing slopes. Hummingbird expects the Project to have storm water discharge during construction and intends to comply with KDOW's Construction Storm Water Discharge General Permit for any construction activities that disturb an acre or more. A Notice of Intent will be submitted before any work begins on the site; Hummingbird will submit a Notice of Termination once work is complete.

Contractors will be required to use silt fences, temporary sediment basins and traps, buffers around streams, wetlands, and open waters, and other BMPs in order to minimize the impacts of stormwater runoff.



Hummingbird or its contractor will prepare and implement a stormwater pollution prevention plan (SWPPP) to comply with KDOW requirements. These BMPs will be used during the construction phase through final vegetative stabilization to minimize sediment runoff into Waters of the U.S. and Commonwealth.

After construction, all disturbed areas not occupied by Project infrastructure will be returned to approximate pre-construction use and capability via reclamation and revegetation. Disturbed soils inside of the Project's fence line will be re-seeded using a mixture of fescue and/or pollinators to stabilize exposed soil and control sedimentation. All plantings and other erosion control measures will be inspected and maintained until the Project site is stable.

If necessary, selective spraying of invasive and nuisance species would be utilized for vegetation control on the site. Any herbicides used will be applied by state licensed commercial pesticide applicators, in accordance with label directions to limit any applications near waters of the U.S. or Commonwealth. This will reduce the risk of unacceptable aquatic impacts.

A small portion of the Project site will be used as temporary construction mobilization and laydown area, which will contain the office trailer, worker parking, equipment and material staging or storage, above ground water and fuel tanks, and assembly areas for the duration of construction activities. Where possible, these will be placed in areas where the proposed solar array will be located. Once construction is complete, all office trailers, equipment, unused materials, and any debris will be removed from the Project site.

Once construction is complete, operation of the Project will have little to no impacts on surface water. BMPs will be utilized during any maintenance activities that may cause runoff of any sediments or pollutants.

## **3.2 GROUNDWATER**

Groundwater is any water found under the earth's surface, including geologic formations which contain sufficient saturated permeable material to produce large quantities of water to wells and springs known as aquifers (USGS 1995). Aquifers are often used as sources of drinking water and irrigation. Any adverse impacts to groundwater could have significant social and economic impacts.

Development of the Project is not anticipated to have any negative impacts to groundwater. Rainwater would run off the panels and either be absorbed into the ground and enter the aquifer or be collected by nearby surface water features.

Hazardous materials in the form of fuels, lubricants and other fluids will be stored on site during construction and leaks and spills could potentially contaminate groundwater. However, contractors will utilize BMPs to minimize the risk of leaks and spills and implement plans and procedures to immediately address spills and leaks that do occur. These efforts will limit the risk of potential impacts to groundwater. Due to the use of BMPs, there are no anticipated direct adverse impacts due to construction of the Project on groundwater.

During construction and operation, it is possible that limited use of fertilizer and herbicides will be used at the Project site. Any chemical use will be conducted in accordance with manufacturer's recommendations to reduce the risk of groundwater contamination.



## 4.0 WASTE

All waste generated during the construction and operation of the Project will be disposed of following all local, state, and federal regulations.

Waste generated during construction activities will include wooden crates, pallets, cardboard boxes and other packaging material. Additionally, excess wiring and other random debris could be intermittently produced. No waste will be disposed of on the Project site. Where practical, construction waste material will be recycled, and any material that cannot be recycled will be disposed of offsite at a permitted facility. Construction contractors and subcontractors will be responsible for proper cleanup, disposal, and storage activities.

Primary construction materials stored on site will be liquids such as, used oil, diesel fuel, gasoline, hydraulic fluid, and other lubricants. Proper disposal containers, obtained by a waste disposal contractor, will be located at onsite staging areas. Waste materials generated during the construction process will be stored in appropriate containers specific to the waste material. The storage containers will have secondary containment in case of tank or vessel failure. Safety data sheets will be available to on-site personnel for all applicable materials.

Fueling of some petroleum fueled construction related machinery, such as tractors, trucks, and semi-trucks will take place on the Project site. Other vehicles will be refueled at on-site layaway areas. Proper storage and handling procedures for preventing spills related to machinery re-fueling will be implemented by the construction contractor. Additionally, spill control kits will be carried on refueling vehicles.

Paint, degreasers, pesticides, herbicides, air conditioning fluids (chlorofluorocarbons [CFC]), gasoline, propane, hydraulic fluid, welding rods, and janitorial supplies may be stored on site in small quantities. Significant environmental impacts caused by a potential spill are not anticipated due to the small quantity of materials and the implementation of proper clean up procedures.

Hummingbird will develop and implement a Hazardous Material Business Plan to ensure the safe handling, storage, and disposal of hazardous materials. Proper personal protective equipment (PPE) will be provided to facility staff and they will be trained in proper use of PPE and the handling, use, and cleanup procedures of hazardous materials used on site. Adequate supplies of applicable clean up materials will be stored on-site.

Designated waste management companies will manage any waste generated on site. Waste produced on site is expected to be minimal and will be mainly related to maintenance or repair of construction equipment.

Additionally, portable chemical toilets will be placed on site for construction workers. Licensed contractors will be responsible for pumping sewage from the portable toilets. The sewage waste will be disposed of at a permitted location selected by the chemical toilet contractor.

Once construction is complete and the Project is in the operation phase, no waste is expected to be generated from the site. Any waste generated during maintenance activities will be removed from the site and disposed of in accordance with state and federal regulations.



Based on review of the potential waste generation activities, adverse effects are not anticipated from general waste or wastewater treatment and disposal.

## 5.0 WATER WITHDRAWAL

Water for construction-related dust control and operations will be obtained from several potential sources, including an on or off-site groundwater well, or trucked from an offsite water purveyor.

Water use related to construction activities will include site preparation such as dust control and grading activities. The primary use of water would be for the grading of access roads, foundations, and equipment pads. Proper BMPs outlined in the SWPPP will be followed during any equipment washing and potential dust control discharges. Groundwater resources are not anticipated to be adversely affected by the volume of water required during the construction process.

Solar electricity operation is not a water-intensive process. Manual washing of solar panels is not anticipated. Rainfall in the region will suffice to remove dust and other debris from the PV panels. However, water will be used for vegetation management needs, including screening vegetation installation and during prolonged periods of drought.





## 6.0 REFERENCES

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