

Exhibit G

Materials Analysis

OAR 345-021-0010(1)(g)

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G.1 INTRODUCTION

OAR 345-021-0010(1)(g) *Exhibit G shall include a materials analysis.*

Exhibit G provides evidence required by OAR 345-022-0120 (1)(g). The following evidence provides an inventory of industrial materials that would flow into and out of the proposed Cascade Wind facility in substantial quantities during construction and operation. Where applicable, this exhibit also describes how UPC Oregon Wind, LLC (Applicant) would manage hazardous and non-hazardous materials during construction and operation.

This exhibit is organized consistent with the Application requirements in OAR 345-022-0120 (1)(g).

OAR 345-021-0010(1)(g) *A materials analysis, including:*

G.2 INVENTORY OF INDUSTRIAL MATERIALS

OAR 345-021-0010(1)(g)(A) *Exhibit G shall include an inventory of substantial quantities of industrial materials flowing into and out of the proposed facility during construction and operation.*

Response:

G.2.1 Construction

Table G-1 provides an inventory of industrial materials that will be used on the facility site in substantial quantities during facility construction and operations. As shown in Table G-1, the primary construction materials are rock and gravel, water, concrete, steel, fiberglass, and assorted electrical equipment.

Construction of new and improved roads will require an estimated 91,545 cubic yards of rock/gravel, which will be brought onto the facility site from off-site quarry sources. The amount of rock and gravel to be used for temporary staging areas will depend on the time of year and weather conditions during construction. Part of the rock/gravel used at temporary staging areas may be reclaimed from the site during post-construction restoration of staging areas.

An estimated 8.7 million gallons of water will be applied by tanker trucks to roads and construction areas during the construction process for road compaction and to reduce dust from trucks and other construction activities. Daily water use will vary, depending on the weather conditions and time of year, which affect the need for dust control. Hot, dry, windy conditions will require greater amounts of water. Tanker trucks will apply water where needed to construction areas to aid in road compaction and reduce construction-generated dust. Water will be mixed with 15,000 cubic yards of cement and aggregate to form concrete to construct the 40 turbine and transformer pads (one transformer pad per turbine). An estimated 400,000 gallons of water will be used for facility-related concrete. See Exhibit O for a more detailed discussion of the water and its source.

Finally, 40 turbine towers will be constructed. An estimated 145 tons of steel (fabricated elsewhere) will be required for each turbine tower, resulting in a total of about 5,800 tons of steel that will be brought onto the facility site. On top of each turbine tower will be a nacelle that houses the turbine, rotor, blades, hub, and gearbox. An estimated 1,600 tons of steel will be needed for construction of the nacelles and attachments. Approximately 720 tons of fiberglass will be used for rotor blades.

An electrical transformer will be adjacent to each turbine tower. Transformers will contain non-polychlorinated biphenyl (PCB) mineral oil and will be sealed; the oil will not be changed. Approximately 13.7 miles of 34.5-kV electrical cable will be used to connect the turbines, of which approximately 8.9 and 4.8 miles will be underground and overhead, respectively. The overhead portions of the electrical cable will be placed above ground on wood poles to span ravines, faults, and roads, and to reduce impacts to streams.

Other ancillary facilities to be constructed include an operation and maintenance (O&M) facility of approximately 3,500 square feet, and two meteorological towers 263 feet in height. The quantity of materials to be used in these structures is very small in comparison to the other materials to be used for this proposed project, and so they are not included in Table G-1.

As indicated in Table G-1, the materials used for construction will remain on site, with the exception of water, which will be lost through absorption and evaporation. Handling of construction wastes is discussed below.

Table G-1. Anticipated Material Usage and Storage

Material	Purpose	Quantity/Units	Ultimate Disposition	Storage Type
Construction				
Rock/gravel	Road construction		On site roads	n/a
Water	Dust control and road compaction	8.7 million gallons	On site (roads, pads, and backfill compaction)	n/a
Concrete	For 40 turbine pads	14,000 cubic yards	On site foundations	n/a
Steel	For 40 turbine towers	5,800 tons	On site towers	n/a
Nacelles (include turbine, rotor, blades, hub, and gearbox)	For 40 turbines	1,600 tons	On site equipment	n/a
Electrical transformers	For 40 turbines and substation	80 tons	On site equipment	n/a
Underground and overhead electrical cable	Electrical gathering system	13.8 miles	On site cabling	n/a
Operations and Maintenance				
Mineral oils	Turbine lubricant	20 gallons	On site turbines	n/a
Synthetic oils	Turbine lubricant	55 gallons	On site turbines	n/a
Simple Green	General cleaner	5 gallons	On site turbines	n/a
WD-40	General lubrication	1 case of aerosol cans	On site turbines	n/a
Round-Up and 2,4-D	Weed control	N/A	On site (roads, pads)	n/a
Gasoline	Mowers, power tools	5 gallons	On site	n/a
Motor oil	Power tools	3 gallons	On site	n/a

Operations

No substantial quantities of industrial materials will be brought on to or removed from the facility site during operations. The only materials that will be brought onto the site will be those related to maintenance and/or replacement of the facilities (e.g., nacelle or turbine components, electrical equipment). The only materials that will be removed from the facility site will be those parts or facilities replaced during maintenance activities. Those materials removed or replaced will not constitute a significant amount.

G.3 MANAGEMENT OF HAZARDOUS SUBSTANCES

OAR 345-021-0010(1)(g)(B) *The applicant's plans to manage hazardous substances during construction and operation, including measures to prevent and contain spills; and*

Response:

Hazardous materials that will be used on the facility site, including lubricating oils, cleaners, and herbicides, are shown in Table G-1. These materials will be used primarily during operations but potentially during construction as well. These hazardous materials will be stored in accordance with applicable regulations.

Hazardous materials will be used in a manner that is protective of human health and the environment and will comply with all applicable local, state, and federal environmental laws and regulations. Accidental releases of hazardous materials (e.g., vehicle fuel during construction or lubricating oil for turbines) will be prevented or minimized through the proper containment of these substances during use and transportation on the facility site. Any oily waste, rags, or dirty or hazardous solid waste will be collected in sealable drums and removed for recycling or disposal by a licensed contractor.

The amounts, types, and use of lubricants and cleaners at a wind facility make accidental releases of a significant quantity of hazardous materials unlikely. In the unlikely event of an accidental hazardous materials release, any spill or release would be cleaned up and the contaminated soil or other materials disposed of and treated according to applicable regulations. See Exhibit CC for a listing of applicable regulations. Spill kits containing items such as absorbent pads will be located on equipment and in the on-site temporary storage facilities to respond to accidental spills that may occur. Employees handling hazardous materials will be instructed in the proper handling and storage of these materials as well as where spill kits are located.

G.4 MANAGEMENT OF NON-HAZARDOUS MATERIALS

OAR 345-021-0010(1)(g)(C) *The applicant's plans to manage non-hazardous waste materials during construction and operation.*

Response:

Solid waste materials will be generated during construction from concrete work. Concrete and excavation waste will be used as fill on site or will be removed from the facility site for fill use elsewhere.

Disposal of materials as fill on site will be conducted in accordance with OAR 340-093-0080 and other applicable regulations. OAR 340-093-0080 provides a variance of permit exemption for disposal of inert wastes. The inert waste must be demonstrated to be substantially the same as “clean fill.” OAR 340-093-0080(2) defines clean fill as material consisting of soil, rock, concrete, brick, building block, tile, or asphalt paving that does not contain contaminants that could adversely impact waters of the state or the United States. To meet the clean fill definition, the inert construction debris will be separated from other debris that is not inert. The only clean fill that has the potential to be disposed of on site will be waste concrete generated during construction. The construction contractor may (with the agreement of the landowner) bury waste concrete (such as excess cement mix from a construction site) on site. In such cases, the material will be placed in an excavated hole, covered with at least 3 feet of topsoil, and regraded to match existing contours.

Any packing materials, paper, and refuse will be separated; accumulated in dumpsters; and periodically removed for recycling or disposal by a licensed waste hauler. Portable toilets will be provided for on-site sewage handling during construction and will be pumped and cleaned regularly by the construction contractor.

G.5 CONCLUSION

The evidence provided above satisfies the Energy Facility Siting Council’s information requirements for materials analysis by providing an inventory of substantial quantities of industrial materials that will be used and by providing the Applicant’s plans for managing hazardous substances and non-hazardous waste materials. The evidence also demonstrates that the materials to be used at the facility site will be managed in a manner that precludes any significant risk to public health and safety.