EXHIBIT G – Application for Site Certificate

MATERIALS ANALYSIS

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

REVIEWER CHECKLIST

(g) Exhibit G. A materials analysis including:

Rule Sections	Section	✓
(A) An inventory of substantial quantities of industrial materials flowing into and out of the proposed facility during construction and operation.	G.2	
(B) The applicant's plans to manage hazardous substances during construction and operation, including measures to prevent and contain spills.	G.3	
(C) The applicant's plans to manage non-hazardous waste materials during construction and operation.	G.4	

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TABLES

G.1 INTRODUCTION

Obsidian Solar Center, LLC (Applicant) proposes to construct the Obsidian Solar Center (Facility) in Lake County, Oregon, with an alternating current generating capacity of up to 400 megawatts. Refer to Exhibit B for Facility layout information and Exhibit C for Facility location information.

Exhibit G provides a materials analysis for the proposed Facility. This exhibit provides the information required by OAR 345-021-0010(1)(g): *A materials analysis.*

As described in Exhibit B, this Application for Site Certificate analyzes two potential design scenarios: a stand-alone photovoltaic (PV) solar power generation build-out, and a PV solar power generation plus battery storage build-out. This exhibit analyzes the PV plus battery storage design scenario, which will require more materials than stand-alone PV due to the larger footprint and inclusion of battery storage enclosures.

G.2 INDUSTRIAL MATERIALS INVENTORY

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

Response: The primary industrial materials to be used during Facility construction and operation are rock and gravel aggregate, water, concrete, steel, and assorted electrical equipment, along with smaller quantities of other materials, including fuels and oils. Table G-1 presents an inventory of materials flowing into and out of the Facility during construction.

Table G-1 Inventory of Materials during Construction

Material/Chemical	Purpose	Estimated Quantity Used during Construction	Ultimate Disposition
Rock/gravel aggregate	Road construction material	110 tons	Permanent installation until Facility is decommissioned
Water	Dust suppression	Up to 68,600 gallons per work day and up to 10,000 gallons per non-work day (up to approximately 34 million gallons)	Evaporation or seepage into the ground
Concrete	Foundations for O&M buildings	Up to 100 cubic yards per building (approximately 200 cubic yards)	Permanent installation until Facility is decommissioned

Table G-1 Inventory of Materials during Construction

Material/Chemical	Purpose	Estimated Quantity Used during Construction	Ultimate Disposition
Concrete	Foundations for battery storage buildings	Up to 125 cubic yards per building (approximately 16,750 cubic yards)	Permanent installation until Facility is decommissioned
Concrete	Foundations for transmission poles	Up to 1,846 cubic yards (approximately 37 poles)	Permanent installation until Facility is decommissioned
Solar PV modules, steel mounting racks, and steel trackers	Solar power generation	Up to 180, 3-MW_{ac} module blocks for solar power generation. Each panel a minimum of 72 cells and 365 watts of polycrystalline on a steel mounting rack and single-axis steel tracker	Permanent installation until Facility is decommissioned
Battery storage enclosures	Flow battery component storage	Up to 134 enclosures	Up to 134 enclosures
Electrical cable	Solar PV collection cables	2 million miles	Permanent installation until Facility is decommissioned
Transmission poles and associated structures	Connection of Facility substation(s) to point of interconnection	Up to 2 miles of transmission line with 300-foot spacing (up to 37 poles)	Permanent installation until Facility is decommissioned
Generator step-up transformer (34.5 to 115 kV)	Solar power generation	Up to 3 transformers	Permanent installation until Facility is decommissioned
Generator step-up transformer (115 to 500 kV)	Solar power generation	Up to 2 transformers	Permanent installation until Facility is decommissioned
Fuel (gasoline and diesel)	Stored onsite, used for construction vehicles	Up to 6,000 gallons	Consumed by construction vehicles
Heavy, medium and light lubrication oils	Heavy and light equipment lubrication	40 gallons	Lubricants to be recycled
Transformer oils (FR3 vegetable oil)	Generator step-up and pad mount transformers	200 transformers; up to 800 gallons per transformer	To be consumed by equipment; recycled
General cleaner	Cleaning equipment	40 gallons	Unused solvent to be recycled or disposed of at appropriate facility

Table G-1 Inventory of Materials during Construction

Material/Chemical	Purpose	Estimated Quantity Used during Construction	Ultimate Disposition
Electrolyte fluid	Flow batteries	Up to 14,000 gallons per MW_{ac}	Used by batteries during operation replaced after useful expected life (approximately 20 years)

Key:
kV = kilovolts
MW_{ac} = alternating current megawatts
O&M = operation and maintenance
PV = photovoltaic

Construction will include installation of concrete foundations for transformer pads and transmission poles; erection of operation and maintenance building(s), substation(s), and a control house building; installation of electrical controls and associated components; erection of battery storage units and installation of batteries; and construction or improvement of various service and access roads within the Facility perimeter fence.

During construction, materials arriving at the Facility site will be delivered to the active work area(s) within the site boundary for installation. Industrial materials flowing into the Facility will include fuels and lubricants associated with construction equipment and solvents. These materials will be brought on site as needed and not stored in large quantities. Any oils, lubricants, and solvents on site will be stored within covered containers such as work trailers and conex boxes to prevent incidental spills or drips from reaching the environment. Fuels will be stored in mobile, double-walled tanks. The primary location for fueling will occur off site at local gas stations, and the mobile tanks will only be used to fuel equipment that cannot travel off site (such as excavators).

Other major categories of material that will flow into the Facility site during construction include rock and gravel to be used on roads, water to be used for dust suppression, concrete, solar PV modules, mounting racks, and motors used for tracking. For service road construction and improvements, the Facility will require as much as 110 tons of aggregate consisting of rock and gravel. Gravel will be obtained from a local commercial gravel source. As described in Exhibit O, as much as 34 million gallons of water (34,300 to 68,600 gallons per construction work day over approximately two years) will be used for dust suppression during construction. Concrete will not be produced on site. The solar PV modules will each consist of a minimum of 72 cells and 365 watts of polycrystalline. Modules will be placed on a rack and mounted on single-axis trackers with other modules and components to form 3-megawatt module blocks. Mounting racks will be constructed of galvanized steel, and post depth will vary based on soil conditions.

Up to 2 miles of 115-kilovolt generation tie transmission line will be constructed using approximately 37 steel poles spaced 300 feet apart, each with a diameter of up to 6 feet and a height of approximately 70 feet. Steel transmission poles will be installed up to 20 feet deep in concrete foundations.

Applicant does not anticipate significant materials to flow into and out of the Facility during operation. New or replacement components and materials related to the storage system will be received on site during operation and the degraded components or elements removed and recycled or disposed of at a permitted waste facility and in accordance with applicable regulation. Otherwise, there will not be substantial quantities of industrial materials flowing into and out of the Facility site during operation.

G.3 HAZARDOUS SUBSTANCES MANAGEMENT PLAN

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.*

Response: During Facility construction and operation, it is expected that a minimal amount of hazardous materials will be generated. Hazardous materials are expected to consist of spent lubrication oils and solvents as listed in Table G-1.

The hazardous materials required for Facility construction and maintenance will be stored in accordance with U.S. Environmental Protection Agency and U.S. Occupational Safety and Health Administration regulations, as applicable. Safety data sheets of each hazardous material will be stored onsite. Facility personnel will receive guidelines and will be trained on the handling, storage, transport, and disposal of hazardous materials.

The Facility will develop a hazardous materials spill prevention program. Hazardous materials will be stored inside and hazardous material containment and cleanup kits will be maintained and available on site to minimize the impact resulting from a spill.

Disposal practices for hazardous waste materials will follow applicable regulations and will depend on the type of waste. Oil and solvents will be recycled when possible; disposed of during a Lake County annual household hazardous waste event, if possible; or transported to the Lake County Landfill, with prior coordination.

Solar PV modules to be installed on the project are not classified as hazardous waste. Applicant’s plans for handling and managing waste materials are further outlined in Exhibit V.

G.4 NONHAZARDOUS WASTE MATERIALS

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

Response:

Construction

Solid waste generated during construction will include general construction debris such as scrap metal (steel, copper, and aluminum), packing materials (e.g., cardboard, pallets), waste concrete, and excavated soil. Detailed information regarding waste materials is included in Exhibit V. During construction, a tub grinder will be kept on site and pallets and other wood waste will be ground and used on site for soil stabilization and ground cover. Excavated soil will be used on site as fill or transported off site for disposal. In addition, a cardboard bailer will be kept on site during construction and waste cardboard will be bailed and deposited with a local contractor. During operation of the Facility, cardboard and packaging waste will either be recycled or collected by local contractor Lakeview Sanitation.

Construction material recycling programs will be implemented to the extent practical to reduce the volume of material disposed of as solid waste. General construction debris will be collected and disposed of by local contractor Lakeview Sanitation.

Waste concrete will be disposed of as solid waste, recycled, or used on site as fill.

During construction, portable toilets and handwash stations will be provided by a local recycling contractor for on-site sanitary waste management. The portable toilets and handwash stations will be maintained by a local contractor. Water for the Facility will be trucked in and may be stored in an aboveground water tank.

Operation

During operation, sanitary waste will be directed to either an on-site septic system or portable toilets, and handwash stations will be provided by a local contractor for on-site sanitary waste management. The portable toilets and handwash stations will be maintained by a local contractor. Washwater from solar panel and equipment washing, which contains no added cleaning solutions, will be discharged by evaporation and seepage into the ground.

Recycling programs for office waste will be implemented to the extent practical to reduce the volume of material that will be disposed of as solid waste. Nonhazardous solid waste generated during operation will be recycled or disposed of as municipal waste, as described in Exhibit V.