Exhibit V

Generation of Solid Waste and Wastewater

Nolin Hills Wind Power Project
January 2022

Prepared for

d/b/a Nolin Hills Wind, LLC

Prepared by

Tetra Tech, Inc.

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List of Attachments

Acronyms and Abbreviations

Applicant	Nolin Hills Wind, LLC
BMP	Best Management Practice
CFR	Code of Federal Regulations
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
Project	Nolin Hills Wind Power Project
WPCF	Water Pollution Control Facility

1.0 Introduction

Exhibit V provides an analysis of solid waste and wastewater generated by the Nolin Hills Wind Power Project (Project), as required to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-021-0010 (1)(v) paragraphs (A) through (G). This exhibit demonstrates that the Project can comply with the Waste Minimization approval standard in OAR 345-022-0120:

OAR 345-022-0120 Waste Minimization

(1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that, to the extent reasonably practicable:

(a) The applicant's solid waste and wastewater plans are likely to minimize generation of solid waste and wastewater in the construction and operation of the facility, and when solid waste or wastewater is generated, to result in recycling and reuse of such wastes;

(b) The applicant's plans to manage the accumulation, storage, disposal and transportation of waste generated by the construction and operation of the facility are likely to result in minimal adverse impact on surrounding and adjacent areas.

(2) The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

(3) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

2.0 Project Waste – OAR 345-021-0010(1)(v)(A)(B)(D)

OAR 345-021-0010(1)(v) Information about the applicant's plans to minimize the generation of solid waste and wastewater and to recycle or reuse solid waste and wastewater, providing evidence to support a finding by the Council as required by OAR 345-022-0120. The applicant must include:

OAR 345-021-0010(1)(A) A description of the major types of solid waste and wastewater that construction, operation and retirement of the facility are likely to generate, including an estimate of the amount of solid waste and wastewater;

OAR 345-021-0010(1)(B) A description of any structures, systems and equipment for management and disposal of solid waste, wastewater and storm water;

OAR 345-021-0010(1)(D) The applicant's plans to minimize, recycle or reuse the solid waste and wastewater described in (A);

2.1 Solid Waste

The following sections identify the types of solid waste anticipated to be generated throughout the Project lifespan, and the estimated quantities of such waste.

2.1.1 Types and Amounts of Solid Waste

2.1.1.1 Solid Waste Produced During Construction

Construction of the Project will generate a small amount of non-hazardous solid waste. Solid waste generated during construction is anticipated to include scrap metal (e.g., wire and rebar scraps), wood, concrete, concrete washout, and other debris. Much of this waste will be packing material such as crates, pallets, and paper wrapping to protect equipment during shipping. It is estimated that Project construction will produce approximately 13,000 to 16,000 cubic yards of waste. Concrete waste will be limited to washout from the concrete truck chutes and other equipment following pouring for foundations.

Access road construction and grading are expected to produce negligible amounts of dirt and rock spoils that will need disposal, since cut and fill measures are expected to balance the need for and use of soils.

The excavation of turbine foundations and installation of solar array tracker posts is expected to produce dirt and rock spoils that will require disposal due to the volume of dirt and rock produced. These materials will be spread over areas previously disturbed during construction. Materials will only be spread as appropriate, resulting in no appreciable grade change and with adequate measures for soil conservation and erosion and sediment control (see Exhibit I). When it is not appropriate to spread materials over previously disturbed areas, materials will be hauled to appropriate disposal sites on participating landowner property; the location of such sites will be determined on an as-needed basis during construction.

Construction of the Project will create some concrete waste from the construction of turbines, Operations and Maintenance (O&M) Building, Substation, battery energy storage system, inverters/transformers foundations, and solar array tracker posts. Concrete truck chutes will be washed down at each foundation site to prevent the concrete from hardening within the chutes. In these cases, the concrete wastewater will be washed out into a dedicated concrete washout area located within each foundation excavation. The bottom will consist of the compacted foundation subgrade and the sides will consist of the excavation side cut, hardened concrete foundation, and soil berms at each end to construct a confined area. The soil used to construct the washout area berms (along with any concrete solids) will be buried as part of the foundation backfill. This

method for concrete washout water management is a regularly utilized Best Management Practice (BMP) for construction of wind generation facilities within eastern Oregon, and has been accepted by the Oregon Department of Environmental Quality (ODEQ).

2.1.1.2 Solid Waste Produced During Operation

An insignificant amount of non-hazardous waste is expected to be generated during the operation and maintenance of the Project. This waste may include equipment and components that are replaced, packing materials for replacement components, and waste typical of a small office employing 10 to 15 people. The non-hazardous waste generated during operation of the Project will be disposed of by a licensed commercial waste hauler or disposed of at either the Columbia Ridge or Finley Butte landfills.

As identified in Exhibit G, there will be up to two lead-acid batteries containing sulfuric acid within their maintenance-free sealed leakproof exterior stored in the control room within the O&M Building within secondary containment. In addition, up to sixty 300-amp-hour lead acid batteries in sealed containers would be held in a wall rack located inside the northern and southern substation power control buildings, for a total of up to 120 lead-acid batteries. The lead-acid batteries will be replaced at least every 5 years, if not earlier, as indicated by the uninterruptible power supply system controls.

Damaged solar panels and their metal would be recycled to the extent practicable. Solar panels are not hazardous and any remaining parts that are not recyclable will be landfilled. Solar panels that are retired but still functional will be repurposed in the secondary market. The Applicant will retire or recycle parts in coordination with a vendor such as the Solar Energy Industries Association National PV Recycling Program, or a similar program.

2.1.1.3 Solid Waste Produced During Decommissioning

The anticipated working lifespan of the Project is 30 years, during or after which period the Project may be extended, repowered, or decommissioned. In the event the Project were decommissioned and the site restored to a useful, non-hazardous condition for other planned uses, the amount of solid waste can be inferred from the Materials Inventory provided in Exhibit G. Should the Project be decommissioned, all turbine components and towers would be removed, all above-ground electrical components would be removed, and concrete foundations would be cut and removed to a minimum depth of 3 feet below ground. Underground cables would typically be left in place, as removing them would cause unnecessary habitat disturbance. Metals and electrical components are expected to be recycled as scrap rather than disposed of in a landfill wherever possible. The portions of concrete foundations that are removed would be disposed of as construction waste. Transformers and other substation equipment would be removed to be reconditioned for use elsewhere or recycled as scrap metal. The control buildings would be demolished and disposed of in an appropriate facility or converted to agricultural buildings for the use of the landowners. None of these materials are considered hazardous. Waste will be disposed of at the Columbia Ridge or Finley Butte landfills. Any hazardous material such as the lead-acid batteries, which contain sulfuric

acid, would be handled by a qualified contractor and adhere to applicable regulations for transport and disposal, including but not limited to 49 Code of Federal Regulations (CFR) §173.159.

2.1.2 Management and Disposal of Solid Waste

The Applicant will comply with all applicable waste handling and disposal regulations on all lands associated with the Project. Solid waste will be stored in a manner that does not constitute a fire, health, or safety hazard until such waste can be hauled off for recycling or disposal as appropriate. The following sections describe the handling and disposal of non-hazardous solid waste planned throughout the duration of the Project.

2.1.2.1 Construction

Construction staging yards, turbine pads, substations, and site access roads will be kept in an orderly condition throughout the construction period. Waste generated during construction of the Project will be temporarily collected at each construction site (e.g., at each turbine location) and then consolidated into larger disposal containers at the construction yards. Disposal and recycling containers will be labeled by waste type to segregate materials as appropriate for recycling or disposal.

Disposal and recycling containers will be of adequate size, design, and number to handle the amount of waste being generated. Roll-off shipping containers will be used to collect scrap metal, wood and paper products, and other recyclable materials. All waste containers will be fitted with lids to prevent waste from being scattered by the wind.

Solid waste generated during construction will be hauled away for recycling or disposal, as appropriate. Paper products and other materials, such as batteries, glass, metals, and plastic, will be recycled when practicable. As disposal and recycling containers reach capacity, they will be removed to disposal facilities that can handle these materials, and the containers will be replaced with empty units. Removal of the waste to appropriate disposal facilities will be done by a licensed waste hauler, under contract to the construction contractor. Licensed waste haulers must comply with OAR 340-093-0220 for transportation of wastes.

Soil and rock materials from foundation excavations will be spread within the temporary disturbance areas during construction or removed from the excavation site as soon as practicable. Most excess spoils generated during road cut and fill excavation activities will be incorporated into Project grading activities as fill material. Excess spoils will be a very small amount, and any excess spoils from excavation of the foundations will be spread out around the foundations. Disturbed soil and rock materials will be contained using appropriate BMPs to prevent sediment from being released to areas not within the construction boundary, especially wetlands and other waters that may be in the vicinity.

The construction contractor will arrange off-site disposal of excess soils if this should be necessary. Disposal sites may be on public or private lands, but must be approved by the Applicant's environmental representatives and the receiving landowner. The disposal contractor will obtain signed consent between themselves and the party receiving the earth materials and copies of the

documentation must be provided to the Applicant. The disposal agreement between the landowner and construction contractor will be in place prior to disposal. All disposal sites will be inspected by the Applicant's environmental personnel to ensure that sensitive environmental resources, such as wetlands or high-quality habitats, are not impacted.

The construction contractor will submit a plan for approval by the Applicant on how solid waste materials during construction activities will be reused, recycled, or disposed of in accordance with OAR 340-093-0010. That plan will specify the number and types of waste containers to be maintained at construction sites and construction yards, and how wastes are to be segregated for recycling or disposal. It will also specify the names and locations of appropriate recycling and waste disposal facilities, collection requirements, and hauling requirements.

2.1.2.2 Operation

Any solid waste generated during repair or replacement of turbines or associated Project components will be collected by the maintenance crews and transported off-site to facilities that handle the disposal or recycling of these items. Wastes generated at the O&M Building will be collected in appropriate waste or recycling containers on site, to be removed by a licensed waste hauler under contract to the Applicant. The lead-acid batteries in the control room of the O&M Building will be replaced every 5 years, if not earlier. As required by regulation, secondary containment will be employed, and the Applicant will include sulfuric acid as part of its annual Emergency Planning and Community Right-to-Know Act report to local emergency responders. Replacement of batteries will be handled by a qualified contractor and adhere to applicable regulations for transport and disposal, including but not limited to 49 CFR §173.159.

2.1.3 Solid Waste Disposal Site

Solid waste generated will be disposed of at the Columbia Ridge or Finley Butte landfills in Gilliam and Morrow counties, respectively, with the exception of the lead-acid batteries, which will be transported and disposed of by a qualified contractor at the appropriate facility to be determined by the contractor. The contractor may use any licensed facility for disposal of lead-acid batteries. Examples of places that could be considered include O'Reilly Auto Parts, Baxter Auto Parts, and Olsen's Auto Parts in Pendleton, Oregon; R.S. Davis Recycling in Hermiston, Oregon; and at least 10 auto supply dealers in Portland, Oregon who use Interstate Batteries to handle lead-acid battery recycling. See Exhibit U for further discussion of landfills. Correspondence with the Columbia Ridge and Finley Butte landfills (see Exhibit U) confirms that both have adequate capacity to handle the waste generated during construction, operation, and decommissioning of the Project.

2.1.4 Umatilla County Solid Waste Management Ordinance

Chapter 50 of the Umatilla County Code of Ordinances pertains to solid waste management. However, the Code of Ordinances does not describe waste management practices or requirements for construction projects, rather it pertains to landfill sites and licensed waste haulers. As such, the

Applicant or its contractor will contract with appropriately licensed waste haulers and recyclers during construction, operation, and decommissioning of the Project. Therefore, no specific elements of the Umatilla County Solid Waste Management Ordinance are required to be applied directly to the Project.

2.2 Wastewater

Wastewater generated by the Project will include sanitary waste and construction wastewater; the latter will consist of equipment wash water and concrete washout water. This section discusses how each of these types of wastewater will be handled throughout the life of the Project.

2.2.1 Sanitary Wastewater

Sanitation during construction activities will be addressed through the provision of portable toilets located throughout the Project Site Boundary at locations that will determined prior to and during construction. Portable toilets will be provided by a licensed subcontractor, who will be responsible for servicing the toilets at regular intervals and disposing of wastewater in accordance with local jurisdictional regulations. The construction contractor will ensure that a sufficient number of toilets are provided, and that the licensed subcontractor complies with applicable regulations, including the use of holding tanks for biological waste that conform to OAR Chapter 340, Division 71 and transportation of waste in accordance with Oregon Revised Statutes 466.005.

For operation and maintenance of the Project, sanitary waste will be handled through an on-site septic system serving the O&M Building. The Applicant will obtain necessary permits for the septic systems from the ODEQ Eastern Region office in Pendleton. A Water Pollution Control Facility (WPCF) permit will not be necessary for this type of use; the WPCF permit is required for disposal of industrial wastewater directly to ground, including processing water; cooling water; stormwater from gravel, placer mining, or from feedlots; vehicle and equipment wash water from stationary wash facilities; and water from petroleum hydrocarbon cleanup. None of these industrial wastewater types will occur with the Project.

Sanitation during decommissioning activities will be addressed similarly as described above for construction.

2.2.2 Construction Wastewater

Construction, operation, or decommissioning activities may generate small amounts of wastewater that can be allowed to infiltrate on-site, according to the terms of a National Pollutant Discharge Elimination System (NPDES) Permit to be issued by ODEQ. Project construction, operation, and decommissioning will not generate substantial amounts of wastewater that will need to be treated as effluent. The nature of the Project is such that it will not produce industrial wastewater.

Most of the wastewater generated during construction will be concrete washout water produced during the construction of turbine and substation foundations. Concrete washout water typically makes up 25 percent of the total water used for concrete in foundations (see Exhibit O).

Concrete wastewater will be washed out into a dedicated concrete washout area located within each turbine or Substation foundation excavation. The bottom of the washout area will consist of the compacted foundation subgrade and the sides will consist of the excavation side cut, hardened concrete foundation, and soil berms at each end to construct a confined area. The soil used to construct the washout area berms (along with any concrete solids) will be buried as part of the foundation backfill. This method for concrete washout water management is a regularly utilized management practice for construction of wind generation facilities within the area, and has been accepted by ODEQ as an appropriate method of concrete washout management on various recent wind generation facilities that have received approval from the Oregon Department of Energy, such as the Wheatridge Wind Energy Facility and the Golden Hills Wind Project.

Washing of vehicles and equipment to prevent the spread of weeds will also generate small amounts of wastewater. Vehicle and equipment washing will occur at construction yards, and wastewater from these activities will be covered by the general NPDES 1200-C stormwater permit (see Exhibit I). The estimated amount of wastewater for vehicle and equipment washing is expected to be minor compared to overall Project water use, and is included in the overall estimates of water use presented in Exhibit O. The amount of water used for vehicle and equipment washing will be sufficiently small that it will not create runoff, but will instead infiltrate into the ground.

Water will be sprayed onto disturbed areas during construction for dust control. The amount of water used for dust control will be sufficiently small that it will not create runoff, but instead infiltrate into the ground. Dust control water, therefore, will not contribute to wastewater volumes.

Stormwater is not considered to be wastewater. Stormwater will be managed in accordance the terms of the NPDES stormwater permit. Stormwater will be diverted around construction sites as much as possible. Precipitation that falls on a construction site will be allowed to run back to natural drainages, with erosion and sedimentation control systems in place to maintain water quality.

Construction dewatering activities are generally not anticipated due to the expected depth to groundwater at the site (see Exhibit H). If necessary, such activities will not considered stormwater discharges but are addressed by the NPDES permit. Typically dewatering discharge (including groundwater dewatering and well development discharge associated with the registered construction activity) is allowed back to the land, provided:

- Dewatering is applied in a way that results in complete infiltration with no potential to discharge to a surface water of the state; and
- BMPs or an approved treatment system (e.g., filter bags) are used to ensure compliance with discharge and water quality requirements.

Testing will not be required unless hazardous materials (e.g., petroleum products) are suspected of being in the water.

2.2.3 Operation Wastewater

During operations, the Applicant will require the use of water for washing solar modules annually. Water for washing the solar panels will be applied via robotic panel cleaners and will not have any cleaning solvents in it. Washwater will be discharged by evaporation and seepage into the ground. The amount of water to be used for washing solar panels is described in Exhibit O. If flow technology is selected for battery storage, then nontoxic ionized solutions will be disposed of at an approved location. CleanEarth in Kent, WA could accept the nontoxic ionized solutions, depending on the type of battery and solution used (see Attachment V-1). If lithium-ion technology is selected, no wastewater will be generated.

2.2.4 Decommissioning Wastewater

Wastewater generated during decommissioning will be similar to that described above for construction, with the exception of wastewater generated from concrete washout. Activities will be covered by a general NPDES 1200-C stormwater permit.

If flow technology is selected for battery storage, then nontoxic ionized solutions will be disposed of at an approved location at the time of decommissioning. CleanEarth in Kent, WA has indicated that they can likely accept the nontoxic ionized solutions, depending on the type of battery and solution used (see Attachment V-1). If lithium-ion technology is selected, no wastewater will be generated at the time of decommissioning the battery storage system.

2.2.4.1 Reduction of Consumptive Water Use – OAR 345-021-0010(1)(v)(C)

OAR 345-021-0010(1)(v)(C). A discussion of any actions or restrictions proposed by the applicant to reduce consumptive water use during construction and operation of the facility;

Minimizing use of water for the Project will be an important environmental consideration as the Project moves into the construction phase. The Applicant will use appropriate BMPs to reduce water use to the greatest extent feasible. Wind energy facility construction by nature does not afford the construction contractor significant opportunities for reducing water use. Specific quantities of water must be used in making concrete, a minimal amount of water is required for washing of concrete trucks and tools, and fugitive dust on surface roads must be controlled with water. In an effort to minimize water use, the Applicant proposes the following:

- Weather and soil conditions will be regularly monitored to minimize watering the construction road while maintaining regulatory compliance for fugitive dust issues. Water for dust control will not be applied if weather conditions are such that disturbed soils remain sufficiently damp and fugitive dust is not created.
- Water will be applied only as needed in areas of active construction or vehicle movement, will be applied sparingly, and only at necessary intervals. Binders or tackifiers, such as magnesium chloride, may be used to lengthen the interval between necessary dust control

water applications, if such additives are permitted by landowners and applicable regulations.

No industrial wastewater will be generated during operations. Operation of the Project does not require consumptive water use, except for minimal amounts at the O&M Building similar in nature to typical office use (see Exhibit O). Blade washing is not anticipated to occur; it has been found to be unnecessary in most environments, does not enhance turbine performance, and is generally not recommended by turbine manufacturers.

3.0 Impacts of Project Waste – OAR 345-021-0010(1)(v)(E),(F)

OAR 345-021-0010(1)(v)(E). A description of any adverse impact on surrounding and adjacent areas from the accumulation, storage, disposal and transportation of solid waste, wastewater and stormwater during construction and operation of the facility;

OAR 345-021-0010(1)(v)(F). Evidence that adverse impacts described in (D) are likely to be minimal, taking into account any measures the applicant proposes to avoid, reduce or otherwise mitigate the impacts;

Generation of wastes from construction will be minimized by estimating material needs and employing efficient construction practices. Waste generated during construction and operation of the Project will be recycled when feasible.

Because waste generation will be minimal, there is little anticipated adverse impact on surrounding areas from solid waste or wastewater from Project construction, operation, or decommissioning. Waste will be reused or recycled, or when necessary, disposed of at permitted disposal facilities. Any waste disposed of on-site (e.g., excess spoils from foundation or road excavation) will be inert, disposed of in a manner consistent with applicable regulations, and protective of human health and the environment.

Water will be used primarily for dust control, concrete mixing, and concrete washout. None of these activities will produce wastewater that will affect area streams, wetlands, or groundwater supplies. Sanitary waste during construction will be handled by a licensed contractor according to applicable regulations. A permitted and properly designed on-site septic system at the O&M Building will safely handle sanitary wastes during operation of the Project. The Project will not generate industrial wastewater or effluent.

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 permit exemption to the disposal permit requirement for disposal of inert wastes such as soil, rock, and concrete that does not contain contaminants that could adversely affect waters of the State or the United States. To meet the clean fill definition, any inert construction debris to be disposed of on-site will be separated from other debris that is not inert.

The Applicant's proposed measures to avoid, reduce, and mitigate any impacts on-site or to adjacent land include storing all petroleum products, paints and finishes, solvents, pesticides and herbicides, and other hazardous materials in containers that meet all federal, state, and local requirements for storage and containment. Petroleum products, including vehicle and equipment fuels, lubricating oils, and hydraulic fluids, will not be stored in substantial quantities on-site, but will instead be delivered on an as-needed basis using a specialized vehicle by a licensed contractor. In addition, spill kits containing items such as absorbent pads will be located on equipment and in on-site temporary storage to ensure a quick response to spills. Waste disposal or recycling will be handled by a licensed contractor.

Transportation of wastes to landfills or recycling facilities will involve periodic truck trips over public and private roads between the Project and the Columbia Ridge or Finley Butte landfills. Given the low number and frequency of these trips, and the anticipated low volume of waste materials, these trips are not anticipated to have adverse effects on the adjacent or surrounding areas (see Exhibit U for more detail on solid waste management).

4.0 Monitoring – OAR 345-021-0010(1)(v)(G)

> *OAR 345-021-0010(1)(v)(G). The applicant's proposed monitoring program, if any, for minimization of solid waste and wastewater impacts.*

Because no significant adverse impacts from waste or wastewater will occur in the adjacent or surrounding areas, no monitoring program is proposed. Waste management activities will be subject to periodic inspections to ensure compliance with applicable regulations.

5.0 Conclusion

The evidence provided above demonstrates that the Oregon Energy Facility Siting Council's Waste Minimization Standard (OAR 345-022-0120) is met because waste generated due to construction, operation, and maintenance of the Project will be minimized, reused, or recycled where feasible, and because minimal adverse impacts on the surrounding or adjacent areas will result from the management of waste related to the Project.

Attachment V-1. Communication with CleanEarth Waste Disposal Facility

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Cavanagh, Suzy

From: Swavely, Bonnie <bswavely@harsco.com>
Sent: Wednesday, February 10, 2021 12:19 PM
To: Cavanagh, Suzy
Subject: Wind/solar/battery project - WA. State

Suzy,
It was nice to talk to you today.
Per our discussion, the chemistry of the battery is important to know in order to understand acceptability and offer pricing.
Similarly, additional information is needed for electrolyte solutions that may be generated in order to determine acceptability and pricing.

As more information becomes available, please contact me to further our discussion.

Regards,

Bonnie Swavely
Vice President - Sales

CleanEarth

M 484.951.6704 O 610.797.7608 x 7221
bswavely@harsco.com
www.cleanearthinc.com
2591 Mitchell Ave., Allentown, PA 18103