Puget Sound Clean Air Agency

Notice of Construction No. **12082**

HEREBY ISSUES AN ORDER OF APPROVAL TO CONSTRUCT, INSTALL, OR ESTABLISH

Registration No. **28503**

Date

DRAFT

Establishment of an aerated static pile (ASP) composting facility. Incoming feedstock for composting is limited to Loop® biosolids and 780 wet tons per year. The facility includes a bulking material bunker, a biosolids bunker, a mixing area with a bunker, four active composting bunkers, a curing area and a screening area. Mixing of biosolids and bulking material occurs on the same day the biosolids are received. ASPs for active composting are built individually in one of the four active composting bunkers, each holding up to 70 cubic yards of total material. Each active composting bunker is covered by a tent/fabric structure that is not fully enclosed but protects the bunkers from rainfall. Built ASPs in the active composting bunkers are covered with a 6 to 12-inch biolayer. The aeration capacity of the ventilation system supplying the ASPs in the active composting bunkers is 5 cfm per cubic yard of total material. The curing area comprises of zones where ASPs are stacked in an extended bed configuration with a maximum of four ASPs built at any one time. The aeration capacity of the ventilation system supplying the ASPs in the curing is 2.5 cfm per cubic yard of total material. Emissions from built ASPs in the active composting bunkers and curing area during negative aeration will be controlled by a biofilter. The biofilter provides an empty-bed residence time of 75 seconds.

OWNER

King Co. DNRP Wastewater Treatment
Steven Yee, 1200 Monster Rd SW
Renton, WA 98057

INSTALLATION ADDRESS

King Co. DNRP Wastewater Treatment
1200 Monster Rd SW
Renton, WA 98057

THIS ORDER IS ISSUED SUBJECT TO THE FOLLOWING RESTRICTIONS AND CONDITIONS

1. Approval is hereby granted as provided in Article 6 of Regulation I of the Puget Sound Clean Air Agency to the applicant to install or establish the equipment, device or process described hereon at the INSTALLATION ADDRESS in accordance with the plans and specifications on file in the Engineering Division of the Puget Sound Clean Air Agency.
2. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.
3. King County is only allowed to compost Class B biosolids generated by King County WWTP facilities. Any other feedstock shall not be allowed to be composted onsite. A feedstock is an organic material that undergoes decomposition with the aid of bulking material. King County shall only use bulking material with C:N ratios greater than 50 and woodchips for bulking material originating from trees, brush, branches, grass, logging residues, stumps, and clean untreated wood waste. Delivery of bulking material may be in the form of woodchips, or as trees, brush, branches, logging residues, stumps or clean untreated wood waste ready to be processed in the grinder. The County will conduct C:N ratio testing of bulking materials once per month during the period of May-October. Any batch of bulking material with a C:N ratio less than 50 will either not be used or will be modified to raise the ratio above 50.
    a. Sampling of feedstock materials shall be conducted according to TMECC 02.01 FIELD SAMPLING OF COMPOST MATERIALS.
    b. For each sample, determination of nitrogen content shall be determined using AOAC 990.03.
    c. For each sample, determination of carbon content shall be determined using AOAC 972.43.

d. Feedstock material may be sampled either before or after delivery to the site.

e. For each sample, records shall be maintained that show who collected the sample, the method of sampling, and the date/time of the sample, the test results for each sample taken at the facility. For analysis provided from a vendor maintain the record supplied by the vendor indicating the results and sampling method.

f. For each batch of compost record the recipe followed and the load identification for each component (feedstock or bulking agent) and document how the C:N ratio was determined.

4. No more than 780 tons of Loop biosolids shall be composted onsite during any 12-consecutive-month period.
5. King County shall implement all the necessary odor control measures to sufficiently prevent odors from the composting operations. Odor associated with the composting operations shall not exceed Level 0 (as defined in Agency Regulation I, Section 9.11(b)(1)) is allowed at or beyond King County's property line.
6. King County shall implement dust control measures to control dust emissions from all activities related to the composting operation to a reasonable minimum. Visible emissions in excess of 5% opacity in aggregate above the height of working equipment for more than three (3) minutes in any one hour as determined by The Washington Department of Ecology Method 9 A are prohibited.
7. King County shall develop an Operations and Maintenance (O&M) Plan consistent with the requirements of Regulation I, Section 5.05(c). The plan must address procedures for determining when the active composting and curing aerated static piles (ASPs), biolayers and biofilters are operating properly and the corrective actions that will be taken when they are not.
8. King County shall inspect the entire composting operation area for visible emissions of fugitive dust at least once per calendar week that composting occurs. The inspection must include an evaluation of whether dust control equipment (e.g., water suppression system(s) or water truck) is being used and operated in good working order. If visible emissions are observed, the owner or operator shall investigate the cause and take immediate corrective action to minimize emissions. King County shall record the date, time, and results of each inspection. If visible fugitive dust emissions were observed during any inspection, the owner or operator shall record the cause and what precautions were taken to minimize emissions.
9. King County shall conduct an inspection of its entire composting operation area at least once per calendar month and monitor along the WWTP's property line for detectable composting odors. If odors greater than level 0 (as defined by Agency Regulation I, Section 9.11(b)(1)) from the composting operations are detected at or outside the property line during the monitoring or at any other time, King County shall take immediate corrective action to eliminate the odors. The monthly inspection shall also include a visual inspection of each ASP, and each biofilter to evaluate whether these activities are being maintained and operated in good working order. The owner or operator shall record the date, time, and results of each inspection, including any corrective actions taken to eliminate odors or maintenance performed on the biofilter.

Composting Feedstock, Bulking Material and Mixing Requirements:

10. All incoming feedstock and bulking material shall be inspected to determine if unacceptable materials are present. Unacceptable materials will be re-loaded and/or transported off King County's premises by the feedstock or bulking material hauler.
11. For each load of feedstock and bulking material received, King County shall record the following information:

    a) Feedstock or bulking material type.
    b) Weight of load.
    c) Results from inspection of the load.

d) Date and time of receipt of the load.
e) Name(s) of employee(s) who performed the inspection.
f) Trackable identification of the load.

12. All feedstock for composting shall be mixed with bulking material and placed in an aerated static pile the same day it is delivered.. All feedstock mixed with bulking material must be placed in an aerated static pile (ASP) within 12 hours of feedstock delivery. With the exception of bulking material or finished compost, no other material may be stored onsite without being placed into an ASP for active composting or curing.
13. To demonstrate compliance with Condition No. 12, King County must record the date and time feedstock is mixed with bulking material and placed in an ASP for active composting. The record must reference to identified load(s) of feedstock that comply with Condition Nos. 10 and 11.
14. King County shall calculate and record the total weight of feedstock received for composting on a monthly and 12-month rolling basis.

Active Composting and Curing Requirements:

15. Each ASP for active composting and curing must be built with a 6 to 12-inch biolayer. The biolayer must uniformly cover the entire surface area of the ASP exposed to ambient air and must be placed on top of each ASP immediately upon building the ASP. The biolayer must be built of finished compost and/or bulking material, or material used to build the biofilter.
16. To demonstrate compliance with Condition No. 15, King County must calculate and record the initial total height of each built biolayer. All data used in verifying compliance with this limit must be retained.
17. Bunker wall height for the ASPs shall not exceed six feet. Built ASPs for active composting (including biolayer) shall not exceed the height of the bunker walls. King County shall calculate and record the initial total height of each bunker wall built for active composting. All data used in verifying compliance with this limit must be retained.
18. Bunker wall height for the ASPs for curing shall not exceed six feet. Built ASPs for curing (including biolayer) must not exceed the height of the bunker walls. King County shall calculate and record the initial total height of each bunker wall built for curing. All data used in verifying compliance with this limit must be retained.
19. Starting from the moment each ASP for composting is built, each ASP for active composting shall operate within the following operational limits at all times:
    (a) The moisture content throughout the entire ASP shall be maintained above 40%.
    (b) The temperature throughout the entire ASP shall be maintained below 76.6°C (170°F), based on an hourly average.
    (c) After day 3 of composting, the average pH of the ASP shall be maintained above 6.0.
    (d) The concentration of oxygen dissolved in water throughout the entire ASP shall be maintained at or above 2 ppm, based on an hourly average. The concentration of oxygen dissolved in water is determined by both the ASP's temperature and oxygen levels.
20. To demonstrate compliance with Condition No. 19(a), the average moisture content of each ASP for active composting shall be measured and recorded upon construction of the pile and upon transition to curing as measured by squeeze test. Records shall be kept of squeeze test result. If squeeze fails to show expected moisture then a sample shall be taken and an oven test performed to document moisture percentage. Multiple measurements shall be made to obtain a value representative of the entire ASP.
21. To demonstrate compliance with Condition No. 19(b), the average temperature of each ASP for active composting shall be monitored and recorded sufficient to demonstrate compliance with WAC 173-308-170(3)(b). The components of the temperature monitoring system shall be calibrated and maintained in

accordance with manufacturer instructions and operating manuals.

22. To demonstrate compliance with Condition No. 19(c), for each mix type the average pH level of each ASP for active composting shall be measured and recorded for the first five batches of a specific mix and then annually so long as the mix isn't changed.

23. To demonstrate compliance with Condition No. 19(d), the average oxygen level of each ASP for active composting shall be measured and recorded at least once each calendar week. Multiple measurements shall be made to obtain a value representative of the entire ASP. The concentration of oxygen dissolved in water must be calculated using the measured average oxygen level coupled with the average temperature of the ASP.

24. During negative aeration of the ASPs built for active composting and curing, all extracted air from the ASPs must vent to the biofilter.

25. The floor aeration systems of all the active composting bunkers and curing zones must be inspected and cleaned every four (4) calendar months. Each inspection must be conducted no less than 90 calendar days, and no more than 135 days, since the last inspection. Copies of the written inspection reports shall be retained for compliance demonstration. Each report must contain the date and time of the inspection and the criteria King County used to determine system integrity.

Biofilter and Biolayers Requirements:

26. The cumulative removal efficiency of the biofilter and biolayers must at all times achieve a minimum removal efficiency of 80 percent for volatile organic compounds and hydrogen sulfide.

27. The cumulative removal efficiency of the biofilter and biolayers must at all times achieve a minimum removal efficiency of 53 percent for ammonia.

28. The biofilter's media bed must have a depth of at least 3 feet and must be composed of clean, freshly shredded root/stump wood or trunk wood with up to 2 percent degradable organic material.

29. The biofilter and biolayers shall be operated within the following operational limits at all times:
    (a) The moisture content in the biofilter shall be maintained between 35% and 75% throughout the bed.
    (b) The temperature in the biofilter shall be maintained between 15^{o}C and 40^{o}C throughout the bed.
    (c) The pH level in the biofilter shall be maintained between 6.0 and 9.5 throughout the bed.

30. The biofilter shall be operated within the following operational limits at all times:
    (a) Maximum pressure drop across the biofilter bed must not exceed 0.8" w.c. per foot of depth.
    (b) The biofilter must meet a minimum operating bed residence time of 60 seconds.
    (c) Pressure drop across the biofilter shall be monitored according to the County's Biofilter Monitoring Plan. Per that Plan, an air pressure sensor will be included in the duct leading to the biofilter, monitored in realtime (with at least one reading per hour), that will notifty the operator through the system operating software when an increase in back pressure is above 75% of the limit of the fan and needs to be addressed.

31. The biofilter and biolayers must be evaluated every six (6) calendar months. Each evaluation must be conducted no less than 150 calendar days, and no more than 210 calendar days, since the last evaluation. A copy of final valuation reports shall be submitted to the Agency no later than 30 days after the evaluation date.

32. Evaluation of the biofilter must determine the operational condition and integrity of the entire biofilter. At a minimum, the biofilter semiannual evaluation must meet the following:
    (a) Testing must occur during the negative aeration of at least three (3) active composting ASPs and three (3) curing ASPs (zones).
    (b) Testing of the media to ensure that the bed of the biofilter is adequately biodegrading the

emissions from the active composting and curing ASPs. Testing of the media must test for the following parameters: moisture content, pH and temperature. Tests methods shall be specified in the facility Operations Plan. A biofilter evaluation plan with detailed sampling protocols to PSCAA shall be submitted to the Agency with the notification required per Regulation I, Section 3.07(b).

(c) An assessment showing that the biofilter adequately drains to ensure that the bed isn't becoming waterlogged during precipitation events. Acceptable metrics shall be determined by King County or the manufacturer/designer of the biofilter. The evaluation must identify deviations from the acceptable metrics.

(d) The evaluation must identify corrective actions needed to correct deviations identified in the primary biofilter evaluation.

33. The first biofilter evaluation must be conducted within 180 days from the first day of operating the biofilter. The date of the biofilter's first day of operation must be recorded in the first evaluation.

34. King County must submit a biofilter evaluation plans with detailed sampling protocols to PSCAA 45 days prior to the first evaluations. After the first evaluations, if the plan is revised in any manner, the revised plans must be submitted to PSCAA 21 days prior to the subsequent evaluation. The evaluation plan(s) shall include:
    (a) A diagram showing the sampling locations within the biofilter. The diagram must show the final depth of each sample core or location or measurement. Depth is measured from the top of the biofilter.
    (b) A description and diagram of the equipment that will be deployed to collect the core samples.
    (c) The procedures that will be used to collect the core samples.
    (d) A description of each test method that will be used to measure and analyze moisture contents, pH levels and temperature.
    (e) The procedures that will be used to calculate the operating bed residence time of the biofilter. This must include procedures for collecting any necessary data for the calculation.
    (f) The procedures that will be used to measure or calculate the pressure drops per foot of depth of the biofilter. This must include procedures for collecting and analyzing any necessary data for the calculation.
    (g) The procedures that will be used to determine adequate drainage of the biofilter and a description of the method of analysis and calculations.

35. King County must correct all deviations identified in biofilter evaluations prior to initiating any subsequent evaluations.

Emissions Performance Requirements:

36. Emissions must not exceed 0.36 pounds of **non-methane organic compounds** per ton of feedstock introduced for composting averaged over the entire composting cycle.

37. Emissions must not exceed 1.55 pounds of **ammonia** per ton of feedstock introduced for composting averaged over the entire composting cycle.

38. Emissions testing of the biofilter and ASPs with biolayers must demonstrate compliance with Condition Nos. 36 and 37. The inlet and the outlet of the biofilter shall be tested for VOCs, ammonia and odors.
    (a) Initial emissions testing must be conducted within 365 days from initially operating the biofilter. Initial compliance must be conducted in accordance with Section 3.07 of Puget Sound Clean Air Agency (PSCAA) and the test plan submitted to PSCAA as required by Condition No. 41.
    (b) Ongoing emissions testing must be conducted every sixty (60) months. Ongoing emissions testing begins from the first date of initial emissions testing. Ongoing compliance must be conducted in accordance with Section 3.07 of PSCAA Regulation I and the test plan submitted to PSCAA as required by Condition No. 41.

39. King County must conduct sampling and analysis of the sampling data per the following:

(a) Sampling of the biofilter must occur during the negative aeration of at least one active composting ASP and one curing ASP.
(b) Sampling of the ASPs must occur during the positive aeration of at least one active composting ASP and one curing ASP.
(c) The total amount of material in each of the active composting bunkers and curing zones must be calculated and recorded each of day of sampling. Amounts must be recorded in tons or cubic yards. Initial construction date of each ASP shall also be recorded.

40. King County shall have emissions tested for compliance with removal efficiency requirements in Condition Nos. 26 and 27. The testing shall be performed in accordance with the following:
    (a) To demonstrate biofilter removal efficiency:
        (1) The concentrations of non-methane organic compounds and ammonia shall be measured as close to the inlet of the header to the biofilter while maintaining good sampling technique to obtain a representative sample.
        (2) Non-methane organic compounds and ammonia concentrations shall be measured at the surface of the biofilter. Sampling can be performed using colorimetric tubes, handheld vapor analyzers, evacuated canisters, or other methods approved by the Agency. The resulting measurements must be representative of the concentrations being emitted by the biofilter. Sample locations shall be distributed to provide measurements that are representative of the removal efficiency of the entirety of the biofilter. The location and method of the sampling must be in the test plan required by Condition 41.
        (3) Sampling at the inlet of the biofilter shall be conducted within four hours of the sampling at the subsurface of the biofilter.
        (4) The average concentrations of non-methane organic compounds and ammonia at the biofilter's inlet (uncontrolled) and surface (controlled) shall be used to determine the cumulative removal efficiencies.
    (b) To demonstrate biolayer removal efficiency:
        (1) The concentrations of non-methane organic compounds, ammonia and hydrogen sulfide, shall be measured at the subsurface of at least one biolayer (2 inches to 4 inches). Sampling can be performed using colorimetric tubes, handheld vapor analyzers, evacuated canisters, or other methods approved by the Agency. The resulting measurements must be representative of the concentrations being emitted by the biofilter. Sample locations shall be distributed to provide measurements that are representative of the removal efficiency of the entirety of the biofilter. The location and method of the sampling must be in the test plan required by Condition 41.
        (2) Sampling at the biolayer shall be conducted within four hours of sampling the corresponding ASP.
        (3) The average concentrations of non-methane organic compounds and ammonia at the biolayer's surface (controlled) and ASP (uncontrolled) shall be used to determine the cumulative removal efficiencies.
    (c) The cumulative efficiency per pollutant is calculated using the following formula:
        1 – ((controlled biolayers average pollutant concentrations + controlled biofilter average pollutant concentration) / (uncontrolled biolayers average pollutant concentrations + uncontrolled biofilter average pollutant concentration))
    (d) The total amount of material in each of the active composting bunkers and curing zones must be calculated and recorded each day of sampling. Amounts must be recorded in tons or cubic yards. Initial construction date of each ASP shall also be recorded.

41. At least 60 days prior to each emissions performance test, King County must submit a test plan. The test plan must address the following:
    (a) A diagram showing the sampling locations of the biofilter and biolayer(s). The diagram must also show the final depth of each sample. Depth is measured from the top of the biofilter bed or

biolayer.
(b) A description and diagram of the equipment that will be deployed to collect all samples.
(c) Procedures to collect all samples.
(d) Description of all the analytical methods and how they will be used to determine concentrations.
(e) Isoflux dynamic-chamber monitoring of times, sweep flow rates, inside and outside air temperatures, exit flow rates and residence times.
(f) Procedures to monitor the amount of material in active composting bunker and curing zone.

42. A testing notification must be submitted to the PSCAA in accordance with Section 3.07 of Regulation I, at least twenty-one (21) days before any emissions test required by this Order of Approval is conducted.

Complaints:

43. King County shall establish a complaint response program for complaints received regarding air quality, including but not limited to odors and/or fugitive dust, as part of an O&M Plan. The program shall include a complaint phone line, criteria and methods for establishing whether the King County composting operation may be the source of the air emissions related to the complaint, and a format for communicating results of investigation and advising complainants of King County's corrective actions.
    (a) The owner or operator shall record and investigate complaints received regarding air quality as soon as possible, but no later than one working day after receipt.
    (b) King County shall correct any problems identified by these complaint investigations within 24 hours of identification or cease operation of the equipment until the problem is resolved;
    (c) Records of all complaints received regarding air quality issues shall include information regarding date and time of complaint; name and address of complainant (if known); nature of the complaint; investigation efforts completed and basis for conclusion reached; and date, time, and nature of any corrective action taken.

Diesel-Fired Trommel Screen Requirements:

44. The 51 hp diesel-fired trommel screen shall not exceed 208 hours per year based on a 12-month rolling average. Records showing the screen's operation shall be used to demonstrate compliance with the operational limitation.

Recordkeeping:

45. All records of observations and supporting documentation required by this Order of Approval shall be completed contemporaneously and no later than the end of each day. Each inspection and observation required on a routine basis by this Order shall be completed for each operational day for the site. An operational day is defined as any day that feedstock, actively composting material, or finished compost is located onsite.

46. The owner or operator shall maintain records required by this Order of Approval for two years and make them available to Puget Sound Clean Air Agency personnel upon request

APPEAL RIGHTS

Pursuant to Puget Sound Clean Air Agency's Regulation I, Section 3.17 and RCW 43.21B.310, this Order may be appealed to the Pollution Control Hearings Board (PCHB). To appeal to the PCHB, a written notice of appeal must be filed with the PCHB and a copy served upon Puget Sound Clean Air Agency within 30 days of the date the applicant receives this Order.

Brian Renninger	John Dawson
Reviewing Engineer	Engineering Manager