

DRAFT Technical Support Document  
DRAFT Notice of Construction Approval Order  
No. 14AQ-C191 Third Revision  
Dirt Hugger LLC  
AQPID No. B0390089  
Dallesport, WA

**Prepared by: Ryan Vicente, PE**

**1. Project Summary**

Dirt Hugger LLC (the source) is an existing compost facility, classified as a 'Synthetic Minor 80 percent' (SM-80) source for VOC emissions, with existing emissions processes and units. This review is for an increase in allowed feedstock stockpiling; an increase in maximum feedstock throughput, operational changes of the composting processes, and increased usage of existing equipment. New equipment was also added.

The Notice of Construction (NOC) application and fee were received on 3/13/23. The source then inquired about additional revision requests on 5/9/23, and requested a pause on processing the application on 5/16/23 pending formalization of the request for those revisions. On 9/21/23, the source canceled the pause, and requested resumption of processing of the original application. Additional materials were received on 10/5/23, 10/19/23, and 1/17/24. Washington State Department of Ecology (Ecology) determined the application as complete on 1/17/24.

**2. Application Processing**

a. Public Notice

This project is subject to a mandatory 30-day public comment period per WAC 173-400-171(3)(b), for increases emissions of toxic air pollutants above the acceptable source impact levels listed under chapter 173-460 WAC. The comment period is scheduled for 2/13/24 through 3/14/24. If any comments are received, responses will be issued as a separate document.

b. State Environmental Policy Act

An existing determination, and the corresponding environmental checklist, was submitted with the NOC Application which considered environmental impacts of the project as required by Chapter 43.21C RCW, also known as the State Environmental Policy Act (SEPA). The city of Klickitat County Health Department issued a Mitigated Determination of Nonsignificance on 1/11/18.

### 3. Applicable Regulations

#### a. State Regulations

##### i. Minor New Source Review Applicability

Per WAC 173-400-110, an NOC application and an order of approval must be issued by the permitting authority prior to the establishment of a new source or modification.

As stated in the NOC application and consistent with Ecology's review, the increase in compost production and engine usage under this project are subject to minor new source review (NSR).

##### A. Exempt Equipment

The project did not include any exempt equipment other than non-road engines.

##### B. Increase in Potential to Emit

The increased potential emissions from the project are greater than the exemption levels listed under WAC 173-400-110(5) as shown below in Tables 1 and 2 (in bold).

**Table 1. Potential emissions for pollutants listed under WAC 173-400-110(5) and NSR Exemption Levels**

<b>Pollutant</b>	<b>Increased Composting (tons/year)</b>	<b>Increased Engine Usage (tons/year)</b>	<b>Minor NSR Exemption (tons/year)</b>
Carbon monoxide (CO)	-	<b>14.7</b>	5.0
Lead (Pb)		3.0E-04	0.005
Nitrogen oxides (NO <sub>x</sub> )	-	1.2	2.0
PM <sub>10</sub>	-	0.62	0.75
PM <sub>2.5</sub>	-	<b>0.62</b>	0.5
Sulfur dioxide (SO <sub>2</sub> )		7.6E-03	2.0
Total suspended particulates (TSP)	-	0.62	1.25
Volatile Organic Compounds (VOC)	<b>4.7</b>	<b>0.56</b>	2.0

**Table 2. Increase in potential TAP emissions and de minimis emission values**

<b>Pollutant</b>	<b>Potential Emissions from Project (lb/AP)</b>	<b>De Minimis Emission Value (lb/AP)</b>	<b>Averaging Period (AP)</b>
1,3-Butadiene	<b>1.6E+01</b>	2.7E-01	year
Acetaldehyde	<b>5.6E+01</b>	3.0E+00	year
Acrolein	<b>9.4E-03</b>	1.3E-03	24-hr
Ammonia	<b>1.4E+01</b>	1.9E+00	24-hr
Arsenic & inorganic arsenic compounds	<b>1.1E-01</b>	2.5E-03	year
Benz[a]anthracene	<b>7.7E-02</b>	4.5E-02	year
Benzene	<b>1.3E+01</b>	1.0E+00	year
Benzo[a]pyrene	<b>8.4E-02</b>	8.2E-03	year
Benzo[b]fluoranthene	<b>1.3E-01</b>	4.5E-02	year
Benzo[k]fluoranthene	<b>1.2E-01</b>	4.5E-02	year
Cadmium & compounds	<b>1.1E-01</b>	1.9E-03	year
Carbon monoxide	<b>4.8E+00</b>	1.1E+00	1-hr
Chlorobenzene	5.5E-05	3.7E+00	24-hr
Chromium(III), soluble particulates	1.4E-04	3.7E-04	24-hr
Chromium(VI) & compounds	<b>7.1E-03</b>	3.3E-05	year
Chrysene	6.9E-02	4.5E-01	year
Copper & compounds	4.7E-05	9.3E-03	1-hr
Dibenz[a,h]anthracene	<b>6.6E-02</b>	4.1E-03	year
Diesel engine exhaust, particulate	<b>1.2E+02</b>	2.7E-02	year
Ethyl benzene	7.8E-01	3.2E+00	year
Formaldehyde	<b>1.2E+02</b>	1.4E+00	year
Hydrogen chloride	<b>5.2E-02</b>	3.3E-02	24-hr
Indeno[1,2,3-cd]pyrene	<b>6.6E-02</b>	4.5E-02	year
Lead & compounds	5.9E-01	1.0E+01	year
Manganese & compounds	8.6E-04	1.1E-03	24-hr
Mercury, elemental	<b>5.5E-04</b>	1.1E-04	24-hr
Naphthalene	<b>2.5E+00</b>	2.4E-01	year
n-Hexane	7.5E-03	2.6E+00	24-hr
Nickel & compounds	<b>2.8E-01</b>	3.1E-02	year
Nitrogen dioxide	3.8E-01	4.6E-01	1-hr
Polycyclic aromatic hydrocarbons	<b>2.6E+00</b>	1.6E-01	year
Propylene	1.9E-01	1.1E+01	24-hr
Selenium & selenium compounds	6.1E-04	7.4E-02	24-hr
Sulfur Dioxide	3.7E-03	4.6E-01	1-hr

<b>Pollutant</b>	<b>Potential Emissions from Project (lb/AP)</b>	<b>De Minimis Emission Value (lb/AP)</b>	<b>Averaging Period (AP)</b>
Toluene	4.4E-02	1.9E+01	24-hr
Xylene (isomer mixture)	1.8E-02	8.2E-01	24-hr

ii. Prevention of Significant Deterioration (PSD)

The existing PTE for the source, prior to the project, is well below the 250 tpy VOC threshold for PSD applicability. The PTE of the source with the proposed project will remain well below the threshold as well. Therefore, PSD does not apply to the proposed project.

iii. Other Applicable Requirements

In accordance with WAC 173-400-113, the proposed new stationary sources must comply with all applicable emission standards adopted under Chapter 70A.15 RCW. The following applicable emission standards are associated with the proposed project:

A. General standards for maximum emissions.

WAC 173-400-040(2) limits visible emissions from all sources to no more than three minutes of 20 percent opacity in any one hour. The standard applies each diesel engine operated as a stationary source. However, these are Tier-four certified engines, and Approval Condition 2.c.iv specifies a more stringent limit of 5 percent opacity. Therefore, the 20 percent limit was not included in the Approval Order.

WAC 173-400-040(3) prohibits sources from emitting of particulate matter such that it's deposited beyond the property under their direct control in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited. The standard applies to each of the compost processes (including stockpiling) and the diesel engines operated as stationary sources. Approval Condition 2.v prohibits visible emissions from both the stationary engines and composting processes at the property boundary.

WAC 173-400-040(4) specifies that the owner or operator of any emissions unit engaging in materials handling shall take reasonable precautions to prevent the release of air contaminants from the operation. The standard applies to each of the compost processes (including stockpiling). Approval Condition 2.v prohibits visible emissions from the composting processes at the property boundary.

WAC 173-400-040(5) specifies that sources use recognized good practice and procedures to reduce odors which may unreasonably interfere with any other property owner's use and enjoyment of their property to a reasonable minimum. Approval Conditions 3.e.ii and 3.h address odors and odor complaints.

B. Emission standards for combustion units.

WAC 173-400-050(1) limits emissions of PM from combustion units to 0.10 grains per dry standard cubic foot (dscf) of exhaust gas. This standard applies to each of the diesel engines being operated as stationary sources. The standard is included as Approval Condition 2.vi.

C. Emission standards for general process units.

WAC 173-400-060 limits emissions of particulate material from any general process operation to 0.10 grains per dscf of exhaust gas. While this standard might apply to compost transfer and screening processes, the standard is not specified in the Approval Order. This is because the equipment does not employ exhaust stacks. Additionally, the moisture contained in the feedstock and compost materials is likely a sufficient control for particulate emissions.

D. Standards of Performance for New Sources

WAC 173-400-115(1)(a) adopts by reference 40 C.F.R. Part 60, Subpart IIII as the regulation existed on 8/24/22. Subpart IIII was since revised on 1/24/23. However, the revisions were specific to: engines used in Alaska and marine offshore installations; and confidential information provisions for engine manufacturers. Therefore, requirements of the state-adopted version are equivalent to the current federal version. Subpart IIII applies to the engines operated as stationary sources (discussed below).

b. Federal Regulations

In accordance with WAC 173-400-113, sources must comply with all applicable new source performance standards (NSPS) included in 40 C.F.R. Part 60, national emission standards for hazardous air pollutants (NESHAPs) included in 40 C.F.R. Part 61, and NESHAPs for source categories included in 40 C.F.R. Part 63. The following applicable emission standards are associated with the proposed project:

i. Standards of Performance for New Stationary Sources

The ICE NSPS (40 C.F.R. Part 60, Subpart IIII) applies to each engine. The regulation specifies:

- Fuel requirements
- Tier-four emission standards, based on engine rating and model year

- Back-pressure monitoring and record keeping for diesel particulate filters
- Compliance requirements

The fuel requirement is the basis of Approval Condition 2.b.v. The Tier-four emission standards specified by the regulation were the basis of the emission limits listed under Approval Condition 2.c.iii. The back-pressure monitoring and recordkeeping are the basis of Approval Conditions 4.l.i and 4.l.ii.

ii. National Emission Standards for Hazardous Air Pollutants for Source Categories

The RICE NESHAP (40 C.F.R. Part 63, Subpart ZZZZ) applies to each genset engine. However, each engine is also subject to the ICE NSPS (see above). At 40 C.F.R. 63.6590(c), the NESHAP specifies that compliance shall be met by meeting the requirements of the NSPS; therefore, no further requirements apply to the engines.

#### 4. Emissions

a. Emission Factors

i. Composting

There were no change in compost emission factors for this project. However, emissions were requantified to reflect increased feedstock acceptance, increase stockpiling, and changes in operations.

Most significantly, the source will be using positive aerated static pile technology to reduce air emissions during Stage 2 of the composting process. Material on the Stage 2 aeration pad will be covered with a 12-inch thick biofilter cap of finished unscreened compost to cure-in-place as batches. This will allow material to be removed from Stage one earlier in the cycle, while still affording the emissions control from the biofilter cap. This resulted in no net increase in site-wide emissions with the increased stockpiling associated with this project.

ii. Engines Operated as Stationary Sources

Emissions of CO, NO<sub>x</sub>, PM, and VOC were calculated using the Tier-four emission standards for each engine. From the standards:

- Nitrogen dioxide was assumed to equal NO<sub>x</sub>
- For exemption threshold and National Ambient Air Quality Standard comparisons, particulate was assumed to include the PM standard and the non-methane hydrocarbons (NMHC) standard.
- For comparison to the 'diesel engine exhaust, particulate' thresholds, particulate was assumed to be equivalent to only the PM standard.

The emission factor for SO<sub>2</sub> was calculated by mass balance, using the maximum permissible sulfur content of ultra-low-sulfur diesel, assuming complete conversion of sulfur to SO<sub>2</sub>.

Fuel-usage based emission factors were employed for lead and other toxic air pollutants (except CO, NO<sub>x</sub>, and SO<sub>2</sub>). For each pollutant, the highest emission factor from the following sources was utilized:

- EPA's AP-42 Compilation of Air Pollutant Emission Factors, 5<sup>th</sup> Edition, Volume 1, Chapter 3.3 - Gasoline and Diesel Industrial Engines, October 1996 (< 600 hp).
- VCAPCD's AB 2588 Combustion Emission Factors, for diesel internal combustion, dated 5/17/01. Bulk 'PAH's (including naphthalene)' was reduced for the stated naphthalene value, with the remainder treated as having five percent of the risk of benzo(a)pyrene. Total chromium was reduced for the stated hexavalent chromium value, with the remainder treated as soluble chromium(III) particles.
- California Air Toxics Emission Factor (CATEF) database, for ICE-diesel, accessed 12/28/22. Duplicated entries were deleted from dataset; pollutants with multiple data points were averaged.

The Tier-4 certified engines were assumed to reduce particulate (including metals) and VOC with an 85 percent and 50 percent removal efficiency, respectively.

b. Best Available Control Technology | Best Available Control Technology for Toxics

i. Composting

The presumptive best available control technology (BACT) for compost operations in this operational range is the employment of a biofilter. While applied, the biofilter reduces VOC emissions by 75 percent as compared to a turned-windrow operation. The biofilter is typically utilized during the first 14-days of the process (the 'active composting' period), where the bulk of emissions occur. The same is true for best available control technology for toxics (tBACT) for ammonia emissions, and the same control efficiency is assumed for that pollutant.

In this project, the source's proposal goes well beyond BACT and tBACT. The increased stockpiling will be controlled via a unscreened finished compost cover, as per previous practice there. This project approves additional compost emissions control of curing emissions, those emissions that occur after the initial 14 days of composting. I believe this is the only compost facility in Washington utilizing controls during curing operations, controlling 75 percent of ammonia and VOC emissions during the entire compost process.

ii. Engines Operated as Stationary Sources

Per the definition of BACT, application of BACT shall not “result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard under 40 C.F.R. Part 60 and Part 61”. As such, the starting point for the BACT analysis was the Tier-4 exhaust emission standards each engine, based on rating and model year.

The consultant provided a summary of previously conducted BACT analyses for data center gensets. Paired with Ecology’s experience with this sector, this was sufficient to support a presumptive BACT determination for the project that the emissions of Tier-two certified engines meet: BACT for CO, lead, NO<sub>x</sub>, particulate, and VOC; and tBACT for the TAPs that triggered review.

I accepted these engines as BACT for CO, PM<sub>2.5</sub>, and VOC, and tBACT for the pollutants triggering review. I made the determination on a presumptive-BACT basis; therefore, I did not request submittal of a top-down BACT analysis. This was justified based on the small size of the new engines, and the engines with increased utilization already having been approved. I am unaware of any feasible and cost-effective method of further control for engines of this size range.

c. Allowable Emissions

The allowable emissions from the project and the source, considering all emission and operational limits contained in the approval order, are shown in the Tables three, four, and six.

**Table 3. Project allowable emissions of pollutants listed under WAC 173-400-110(5)**

<b>Pollutant</b>	<b>Increased Composting (tons/year)</b>	<b>New Engines and Increased Usage (tons/year)</b>
CO	-	5.7
NO <sub>x</sub>	-	0.46
Pb	-	2.3E-05
PM <sub>10</sub>	-	0.24
PM <sub>2.5</sub>	-	0.24
SO <sub>2</sub>	-	3.0E-03
TSP	-	0.24
VOC	4.7	0.22



**Table 4. Allowable Emissions for Total Source**

<b>Pollutant</b>	<b>Total Source Allowable Emissions (tons/year)</b>
CO	10.9
NO <sub>x</sub>	0.87
Pb	3.9E-05
PM <sub>10</sub>	0.46
PM <sub>2.5</sub>	0.46
SO <sub>2</sub>	5.0E-03
TSP	0.46
VOC	97.2

**5. Ambient Air Quality Standards**

As specified in WAC 173-400-113, the proposed new or modified source(s) must not cause or contribute to a violation of any ambient air quality standard. This includes the ambient air quality standards for both criteria and toxic air pollutants.

a. Pollutants Listed Under WAC 173-400-110 (Except TAPs)

Since the PM<sub>2.5</sub> allowable emissions of the project, as limited by the NOC Approval Order, are below the Table 110(5) exemption level listed under WAC 173-400-110, modeling was not required for that pollutant. This is in keeping with prior practice within this section, where it is assumed that the exemption levels were based on concentrations which would not cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS) or Washington Ambient Air Quality Standards (WAAQS).

While VOC emissions from the project are above the exemption level listed under WAC 173-400-110, dispersion modeling was not conducted for this project. This is because VOC is not a criteria air pollutant. While, under the right conditions, VOC is a precursor for ozone and secondary PM<sub>2.5</sub> (criteria pollutants), this source's VOC emissions are not expected to contribute to NAAQS exceedances.

To satisfy the requirements of Chapter 173-476 WAC, modeling was performed for emissions of CO. The modeling demonstrates that the emissions increases as a result of the project will not exceed the NAAQS or WAAQS. The modeling results are included in the table below.

**Table 5. Criteria Pollutant Modeling Results**

Criteria Pollutant	Averaging Period	Modeled Concentration	NAAQS
CO	1-hr	3,524	40,000
CO	8-hr	1,920	10,000

b. Toxic Air Pollutants

In accordance with WAC 173-460-040, new TAP sources must meet the requirements of Chapter 173-460 WAC, unless they are exempt by WAC 173-400-110(5).

As shown in Table 2, minor NSR is required for the project. As such, the new emission units must comply with WAC 173-460-070 (ambient impact requirement). The facility may demonstrate compliance with the ambient impact requirement by either showing that the emissions increase is less than the small quantity emissions rates (SQER) or through dispersion modeling. The table below includes the estimated emissions increases associated with the project and the applicable SQER; emissions above the SQER are in bold.

**Table 6. TAP Analysis**

Pollutant	Project Increase (lb/AP)	SQER (lb/AP)	Averaging Period (AP)	Modeling Required?
1,3-Butadiene	3.1E+00	5.4E+00	year	no
Acetaldehyde	1.1E+01	6.0E+01	year	no
Acrolein	4.7E-03	2.6E-02	24-hr	no
Ammonia	1.3E+00	3.7E+01	24-hr	no
Arsenic & inorganic arsenic compounds	9.0E-03	4.9E-02	year	no
Benz[a]anthracene	1.5E-02	8.9E-01	year	no
Benzene	2.6E+00	2.1E+01	year	no
Benzo[a]pyrene	1.6E-02	1.6E-01	year	no
Benzo[b]fluoranthene	2.5E-02	8.9E-01	year	no
Benzo[k]fluoranthene	2.4E-02	8.9E-01	year	no
Cadmium & compounds	8.5E-03	3.9E-02	year	no
Carbon monoxide	4.8E+00	4.3E+01	1-hr	no
Chromium(VI) & compounds	5.6E-04	6.5E-04	year	no
Dibenz[a,h]anthracene	1.3E-02	8.2E-02	year	no
Diesel engine exhaust, particulate (DEEP)	<b>4.6E+01</b>	5.4E-01	year	<b>yes</b>

Pollutant	Project Increase (lb/AP)	SQER (lb/AP)	Averaging Period (AP)	Modeling Required?
Formaldehyde	2.4E+01	2.7E+01	year	no
Hydrogen chloride	2.6E-02	6.7E-01	24-hr	no
Indeno[1,2,3-cd]pyrene	1.3E-02	8.9E-01	year	no
Mercury, elemental	1.1E-04	2.2E-03	24-hr	no
Naphthalene	5.0E-01	4.8E+00	year	no
Nickel & compounds	2.2E-02	6.2E-01	year	no
Polycyclic aromatic hydrocarbons	5.1E-01	3.2E+00	year	no

For DEEP, modeling was performed to satisfy the requirements of Washington’s state toxics rule in Chapter 173-460 WAC. The modeling results are included in the table below.

**Table 7. TAP Modeling Results**

TAP	Averaging Period	Maximum Modeled Concentration (µg/m³)	ASIL (µg/m³)	Percent of ASIL
DEEP	annual	7.57E-02	3.3E-03	2,300%

As shown in the table above, DEEP emissions were modeled above the acceptable source impact level (ASIL) screening threshold. A streamlined Second-Tier Health Impact Assessment (HIA) was conducted for DEEP with the NOC application, per WAC 173-460-090. Ecology reviewed the assessment and recommended approval of the project. Ecology’s analysis and recommendations are included in the document titled, Second Tier Review Recommendation for: Dirt Hugger Compost Facility Material Throughput Increase, January 2024.